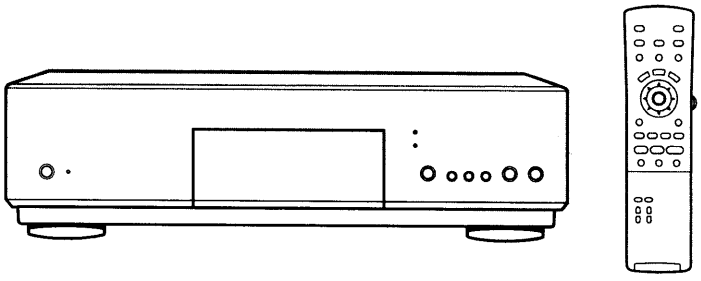
TOSHIBA

FILE NO. 810-200015

SERVICE MANUAL

DVD VIDEO/AUDIO PLAYER

SD-900EE



PRINTED IN JAPAN, Oct., 2000 Ⓢ

LASER BEAM CAUTION LABEL

CAUTION
VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.
ATTENTION
RAYONNEMENT VISIBLE ET INVISIBLE LASER EN CAS D'OUVERTURE. NE PAS REGARDER DANS LE FAISCEAU. NI À L'O EIL NU NI À L'AIDE D'INSTRUNENTS D'OPTIQUE.
VORSICHT
SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT IN DEN STRAHL BLICKEN AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.
注 意 ここを開くと可視レーザー光及び不可視レーザー光がでます。ビームを直接見たり触れたりしないこと。光学機器で直接ビームを見ないこと。
ADVARSEL
SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. SE IKKE IND I STRÅLEN-HELLER IKKE MED OPTISKE INSTRUMENTER.
ADVARSEL
SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. STIRR IKKE INN I STARÅLEN ELLER SE DIREKTE MED OPTISKE INSTRUMENTR.
VARO!
AVATTAESSA OLET ALTTINA NÄKYVÄÄ JA NÄKYMÄTÖN LASERSÄTEIL YLLE. ÄLÄ TULJOTA SÄTEESEEN ÄLÄKÄ KATSO SITÄ OPTISEN LAITTEEN LÄPI.
VARNING
SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. STIRRA EJ IN I STRÅLEN OCH BETRAKTA EJ STRÅLEN MED OPTISKA INSTRUMENT.
98764189

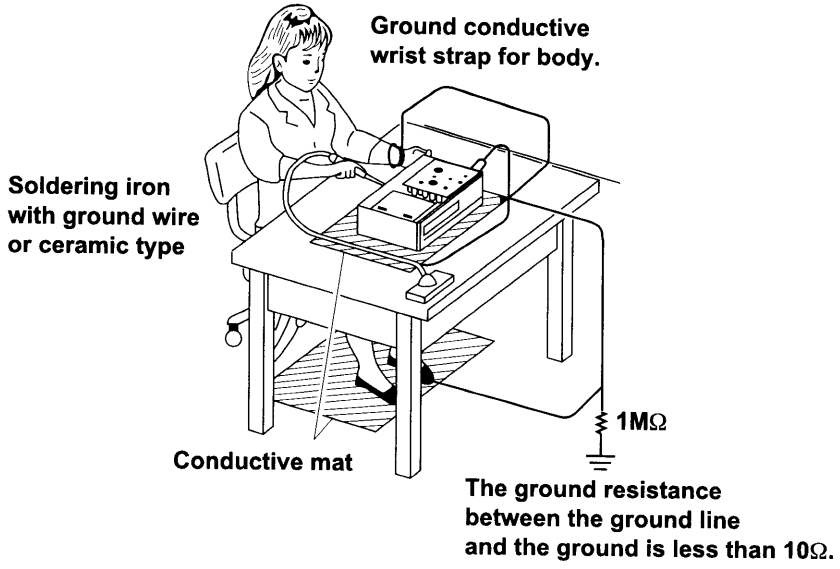
When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of a laser may be recceived.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electricity.

Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire, etc. to protect the laser diode from damage by static electricity.

And also, the LSI and IC are same as above.


Ground conductive wrist strap for body.
Soldering iron with ground wire or ceramic type
1MΩ
Conductive mat
The ground resistance between the ground line and the ground is less than 10Ω.

CONTENTS

SECTION 1
GENERAL DESCRIPTIONS

1. OPERATING INSTRUCTIONS 1-1
2. LOCATION OF MAIN PARTS AND MECHANISM PARTS 1-36
   2-1. Location of Main Parts 1-36
   2-2. Location of Mechanism Parts 1-37
3. TROUBLESHOOTING 1-40
   3-1. Main Circuit 1-40
   3-1-1. Servo System 1-40
   3-1-2. Location Diagram of Servo Test Point 1-47

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

1. REPLACEMENT OF MECHANICAL PARTS 2-1
   1-1. Cabinet Replacement 2-1
   1-1-1. Top Cover 2-1
   1-1-2. Bottom Plate 2-1
   1-1-3. Front Panel 2-2
   1-1-4. Rear Panel 2-2
   1-2. PC Board Replacement 2-3
   1-2-1. Sub Video PC Board 2-4
   1-2-2. Main PC Board 2-4
   1-2-3. Output PC Board 2-5
   1-2-4. Power Supply PC Board 2-5
   1-2-5. Front and Power SW PC Boards 2-6
   1-2-6. Display PC Board 2-6
   1-3. Mechanism Parts Replacement 2-7
   1-3-1. Mechanism Chassis Assembly 2-7
   1-3-2. Tray Assembly 2-8
   1-3-3. Loading Belt, Loading Motor, Loading Gear 2-9
   1-3-4. Eject detection switch 2-9
   1-3-5. Mechanism detection switch 2-9
   1-3-6. Sub Chassis 2-10
   1-3-7. Pickup Mechanism Assembly 2-10
   1-3-8. Gear B Assembly, Gear A and Rack Gear Assembly 2-11
   1-3-9. Feed Motor 2-12

SECTION 3
SERVICING DIAGRAMS

1. STANDING PC BOARDS FOR SERVICING 3-1
2. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION 3-2
   2-1. Precautions for Part Replacement 3-2
   2-2. Solid Resistor Indication 3-2
   2-3. Capacitance Indication 3-2
   2-4. Inductor Indication 3-3
   2-5. Waveform and Voltage Measurement 3-3
3. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM 3-5
4. BLOCK DIAGRAMS 3-7
   4-1. Overall Block Diagram 3-7
   4-2. Power Supply Block Diagram 3-9
   4-3. Front, Display, Power Switch Block Diagram 3-10
   4-4. Main Block Diagrams 3-13
   4-5. Output Block Diagram 3-17
5. CIRCUIT DIAGRAMS 3-19
   5-1. Power Supply Circuit Diagram 3-19
   5-2. Front, Display, Power Switch Circuit Diagram 3-22
   5-3. Main Circuit Diagram 3-26
   5-4. Sub Video Circuit Diagram 3-45
   5-5. Video Output Circuit Diagram 3-48
   5-6. Audio Output Circuit Diagram 3-53
   5-7. Motor System Circuit Diagram 3-58
6. PC BOARDS 3-60
   6-1. Power Supply PC Board 3-60
   6-2. Power Switch PC Board 3-61
   6-3. Front PC Board 3-62
   6-4. Main PC Board 3-64
   6-5. Output PC Board 3-74
   6-6. Display PC Board 3-78
   6-7. Sub Video PC Board 3-80

SECTION 4
PARTS LIST

SAFETY PRECAUTION 4-1
NOTICE 4-1
ABBREVIATIONS 4-1
   1. Integrated Circuit (IC) 4-1
   2. Capacitor (Cap) 4-1
   3. Resistor (Res) 4-1
4. EXPLODED VIEWS 4-2
   4-1. Packing Assembly 4-2
   4-2. Chassis Assembly 4-3
   4-3. Mechanism Assembly 4-4
5. PARTS LIST 4-5

SAFETY PRECAUTIONS

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

CAUTION: This Digital Video Disc Player employs a Laser System.
To ensure proper use of this product, please read this owner's manual carefully and retain for future reference. Should the unit require maintenance, contact an authorized service location - see service procedure.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

To prevent direct exposure to laser beam, do not try to open the enclosure.
Visible and invisible laser radiation when open and interlocks defeated.
DO NOT STARE INTO BEAM.

CLASS 1
LASER PRODUCT

In the spaces provided below, record the Model and Serial No. located on the rear panel of your DVD player.

Model No. _____ Serial No. _____

Retain this information for future reference.

The following information applies only to the model for U.K.

General Information

If the socket outlets in your home are not suitable for the plug supplied with this unit, the plug must be cut off and an appropriate one fitted.

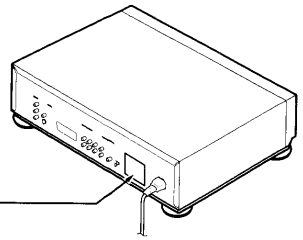
The plug severed from this mains lead must be destroyed as it is hazardous if inserted into a live socket.

IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:
BLUE: NEUTRAL
BROWN: LIVE
As the colours of the wires in the mains lead of this unit may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire that is coloured blue must be connected to the terminal in the plug which is marked with the letter N or coloured black.
The wire that is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Do not connect either wire to the earth terminal which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

Use a 5A fuse which is approved by ASTA or BSI to BS1362.
Always replace the fuse cover after changing the fuse.

Location of the required label



The rating plate and the safety caution are on the rear of the unit.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

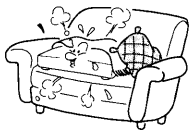
This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.

DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

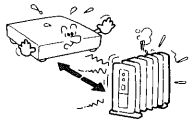
1. Read owner's manual
   After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.

2. Power Sources
   This product should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

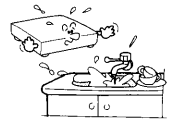
3. Ventilation
   Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.



4. Heat
   The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.



5. Water and Moisture
   Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like.

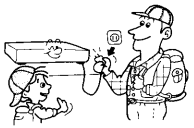


6. Cleaning
   Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. Power-Cord Protection
   Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

8. Overloading
   Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

9. Lightning
   For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.



10. Object and Liquid Entry
    Never insert objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

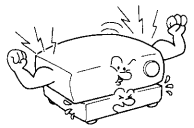
11. Attachments
    Do not use attachments not recommended by the product manufacturer as they may cause hazards.

IMPORTANT SAFETY INSTRUCTIONS

12. Accessories
Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

13. Disc Tray
Keep your fingers well clear of the disc tray as it is closing. Neglecting to do so may cause serious personal injury.

14. Burden
Do not place a heavy object on or step on the product. The object may fall, causing serious personal injury and serious damage to the product.

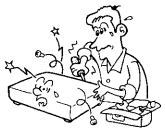


15. Headphones
When you use headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

16. Disc
Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.

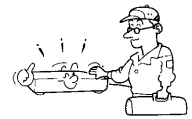
17. Damage Requiring Service
Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
a) When the power-supply cord or plug is damaged.
b) If liquid has been spilled, or objects have fallen into the product.
c) If the product has been exposed to rain or water.
d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e) If the product has been dropped or damaged in any way.
f) When the product exhibits a distinct change in performance - this indicates a need for service.

18. Servicing
Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.



19. Replacement Parts
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

20. Safety Check
Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.



Precautions

Notes on handling

- When shipping the DVD player, the original shipping carton and packing materials come in handy. For maximum protection, repack the unit as it was originally packed at the factory.
- Do not use volatile liquids, such as insect spray, near the DVD player. Do not leave rubber or plastic products in contact with the DVD player for a long time. They will leave marks on the finish.
- The top and rear panels of the DVD player may become warm after a long period of use. This is not a malfunction.
- When the DVD player is not in use, be sure to remove the disc and turn off the power.
- If you do not use the DVD player for a long period, the unit may not function properly in the future. Turn on and use the DVD player occasionally.

Notes on locating

- Place the DVD player on a level surface. Do not use it on a shaky or unstable surface such as a wobbling table or inclined stand. The loaded disc may come off the proper position and cause damage to the DVD player.
- When you place this DVD player near a TV, radio, or VTR, the playback picture may become poor and the sound may be distorted. In this case, place the DVD player away from the TV, radio, or VTR.

Notes on cleaning

Use a soft, dry cloth for cleaning.

- For stubborn dirt, soak the cloth in a weak detergent solution, wring well and wipe. Use a dry cloth to wipe it dry.
  Do not use any type of solvent, such as thinner and benzine, as they may damage the surface of the DVD player.
- If you use a chemical saturated cloth to clean the unit, follow that product's instructions.

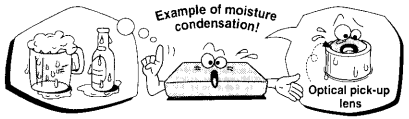
To obtain a clear picture

The DVD player is a high technology, precision device. If the optical pick-up lens and disc drive parts are dirty or worn down, the picture quality becomes poor. To obtain a clear picture, we recommend regular inspection and maintenance (cleaning or parts replacement) every 1,000 hours of use depending on the operating environment. For details, contact your nearest dealer.

Notes on moisture condensation

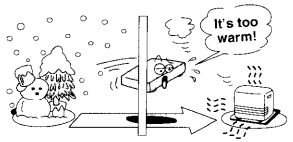
Moisture condensation damages the DVD player. Please read the following carefully.

Moisture condensation occurs, for example, when you pour a cold drink into a glass on a warm day. Drops of water form on the outside of the glass. In the same way, moisture may condense on the optical pick-up lens inside this unit, one of the most crucial internal parts of the DVD player.



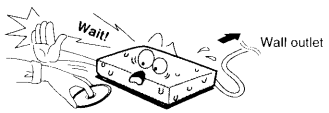
■ **Moisture condensation occurs during the following cases.**

- When you bring the DVD player directly from a cold place to a warm place.
- When you use the DVD player in a room where you just turned on the heater, or a place where the cold wind from the air conditioner directly hits the unit.
- In summer, when you use the DVD player in a hot and humid place just after you move the unit from an air conditioned room.
- When you use the DVD player in a humid place.



■ **Do not use the DVD player when moisture condensation may occur.**

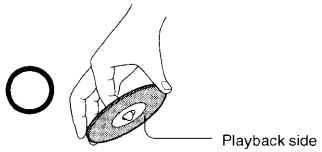
If you use the DVD player in such a situation, it may damage discs and internal parts. Remove the disc, connect the power cord of the DVD player to the wall outlet, turn on the DVD player, and leave it for two or three hours. After two or three hours, the DVD player will have warmed up and evaporated any moisture. Keep the DVD player connected to the wall outlet and moisture condensation will seldom occur.



Notes on Discs

On handling discs

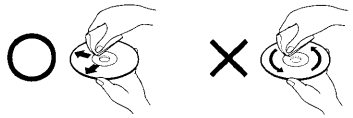
- Do not touch the playback side of the disc.



- Do not attach paper or tape to discs.

On cleaning discs

- Fingerprints and dust on the disc cause picture and sound deterioration. Wipe the disc from the center outwards with a soft cloth. Always keep the disc clean.



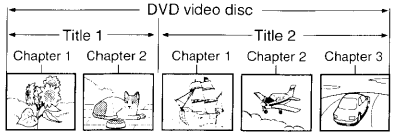
- If you cannot wipe off the dust with a soft cloth, wipe the disc lightly with a slightly moistened soft cloth and finish with a dry cloth.
- Do not use any type of solvent such as thinner, benzine, commercially available cleaners or antistatic spray for vinyl LPs. It may damage the disc.

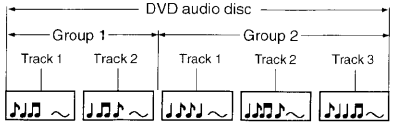
On storing discs

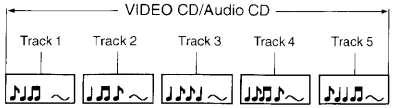
- Do not store discs in a place subject to direct sunlight or near heat sources.
- Do not store discs in places subject to moisture and dust such as a bathroom or near a humidifier.
- Store discs vertically in a case. Stacking or placing objects on discs outside of their case may cause warping.

Structure of disc contents

Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. DVD audio discs are divided into groups, and the groups are sub-divided into tracks. VIDEO CDs/audio CDs are divided into tracks.







Each title, chapter, group, or track is assigned a number, which is called "title number", "chapter number", "group number" or "track number" respectively.
There may be discs that do not have these numbers.

Notes on copyright

It is forbidden by law to copy, broadcast, show, broadcast on cable, play in public, and rent copyrighted material without permission.

DVD video discs are copy protected, and any recordings made from these discs will be distorted.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Notes on Discs (continued)

About this owner's manual

This owner's manual explains the basic instructions of this DVD player. Some DVD video discs are produced in a manner that allows specific or limited operation during playback. As such, the DVD player may not respond to all operating commands. This is not a defect in the DVD player. Refer to instruction notes of discs.

"⊘" may appear on the TV screen during operation. A "⊘" means that the operation is not permitted by the DVD player or the disc.

Notes on region numbers

The region number of this DVD player is 2. If region numbers, which stand for their playable area, are printed on your DVD video disc and you do not find 2 or ALL, disc playback will not be allowed by the player. (In this case, the DVD player will display a message on-screen.)

On VIDEO CDs

This DVD player supports VIDEO CDs equipped with the PBC (Version 2.0) function. (PBC is the abbreviation of Playback Control.) You can enjoy two playback variations depending on types of discs.

- **VIDEO CD not equipped with PBC function (Version 1.1)**
  Sound and movie can be played on this DVD player in the same way as an audio CD.
- **VIDEO CD equipped with PBC function (Version 2.0)**
  In addition to operation of a VIDEO CD not equipped with the PBC function, you can enjoy playback of interactive software with search function by using the menu displayed on the TV screen (Menu Playback). Some of the functions described in this owner's manual may not work with some discs.

Playable discs

This DVD player can play the following discs.

	Disc Mark	Contents	Disc Size
DVD video discs	DVD VIDEO / DVD VIDEO	Video (moving pictures) + Audio	12 cm / 8 cm
DVD audio discs	DVD AUDIO	Audio	12 cm / 8 cm
VIDEO CDs	COMPACT disc DIGITAL VIDEO	Video (moving pictures) + Audio	12 cm / 8 cm
Audio CDs	COMPACT disc DIGITAL AUDIO	Audio	12 cm / 8 cm (CD single)

The following discs are also available.
● CD-R
● CD-RW
CD-R/RW discs recorded by CD-DA method can be played. Some CD-R/RW discs may be incompatible.

- You cannot play discs other than those listed above.
- You cannot play discs of DVD-RAM, DVD-RW, etc., even if they may be labeled marks listed above.
- This DVD player uses the PAL/NTSC color system, and cannot play DVD video discs recorded in any other color system (SECAM, etc.).

1-5

Table of Contents

Introduction
●SAFETY PRECAUTIONS 2
●IMPORTANT SAFETY INSTRUCTIONS ... 4
●Precautions 8
●Notes on Discs 9
Notes on region numbers 10
●Table of Contents 11
●Identification of Controls 12
Front panel 12
Rear panel 12
DVD display 13
Remote control 14
Loading batteries 15
Operating with the remote control 15

Connections
●Connecting to a TV 18
Connecting to a TV (Using the SCART socket) 18
Connecting to a TV (Using the component video jacks) 19
Connecting to a TV (Using the phono type jacks) 20
●Connecting to Optional Equipment 21
Connecting to an amplifier equipped with a Dolby Digital decoder 22
Connecting to an amplifier equipped with Dolby Pro Logic Surround 22
Connecting to an amplifier equipped with a DTS decoder 23
Connecting to an amplifier equipped with an MPEG2 audio decoder 23
Connecting to an amplifier equipped with 5.1ch audio inputs 24
Connecting to an amplifier equipped with a digital audio input 24

Basic playback
●Playing a Disc 26
Basic playback 26
●Variable Speed Playback 29
Playing in fast reverse or fast forward directions 29
Playing frame by frame 29
Playing in slow-motion 30
Resuming playback from the same location ... 30
●Locating a Desired Section 31
Locating a title using the top menu 31
Locating a desired section by entering the corresponding number 32
Locating a specific chapter or track 32

Advanced playback
●Accessing a Specific Location Directly .. 34
Entering the time of the desired location 34
●Playing Repeatedly 35
Repeating a title, chapter, group or track 35
Repeating a specific segment 35
●Playing in a Favorite Order 36
Setting titles, chapters, group or tracks in a favorite order 36
●Playing in Random Order 37
Playing titles, chapters or tracks in random order 37
●Zooming a Picture 38
Zooming a picture 38
●Selecting 3D DNR Picture Enhancement 39
Selecting 3D DNR picture enhancement 39
●Selecting 3-D (N-2-2) Sound Enhancement 39
Selecting 3-D (N-2-2) sound enhancement 39
●Selecting the Camera Angle 40
Changing the camera angle 40
●Selecting Subtitles 41
Selecting a subtitle language 41
●Selecting a Language 42
Selecting a playback audio setting 42

Quick control
●Using the Graphic Remote Control - V-REMOTE - 46
●Selecting the Playback Function - QUICK - 47
●Accessing Features - NAVI - 48

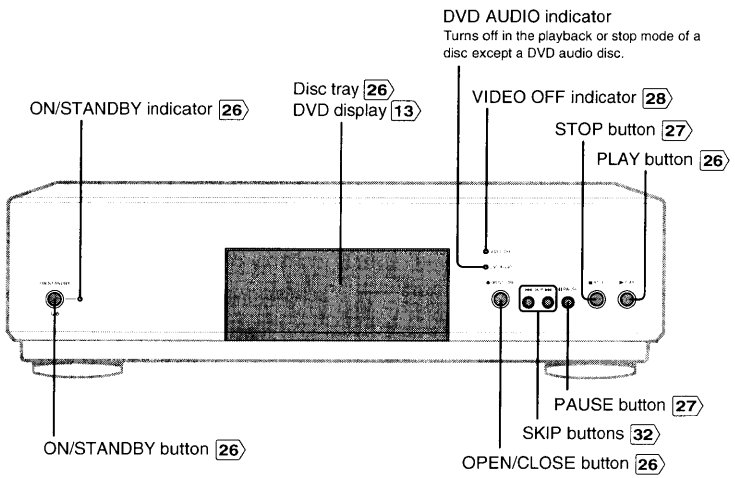
Function setup
●Customizing the Function Settings 54
Setting procedure 54
Setting details 57
●Table of Languages 66
●Operating a TV with the Remote Control 67

Others
●Before Calling Service Personnel 70
●Specifications 71

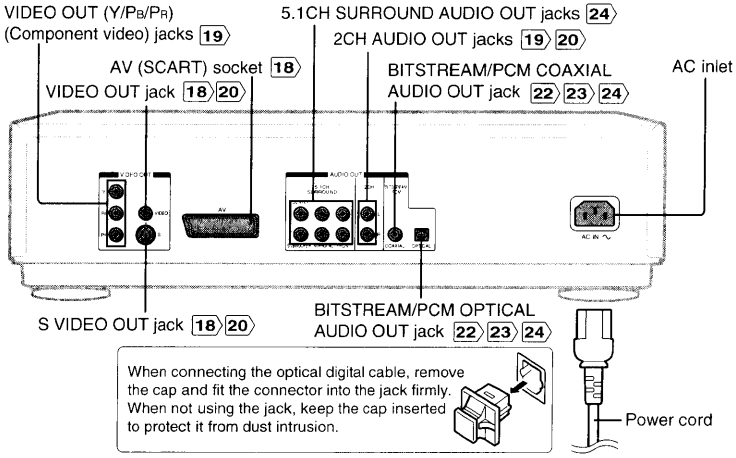
Identification of Controls

See the page in ⟩ for details.

Front panel

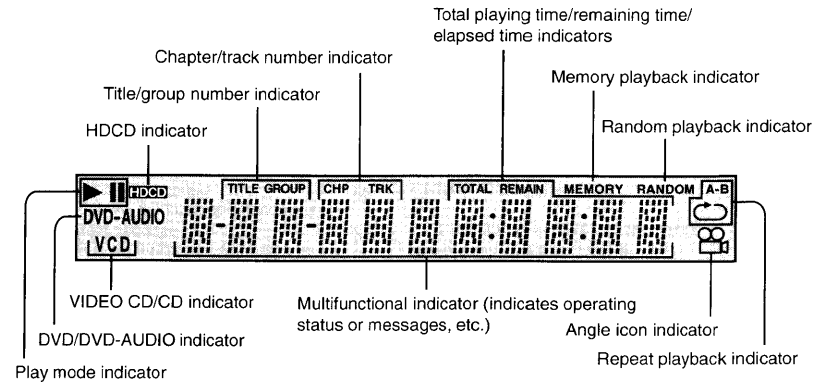

DVD AUDIO indicator
Turns off in the playback or stop mode of a disc except a DVD audio disc.
Disc tray 26
DVD display 13
ON/STANDBY indicator 26
VIDEO OFF indicator 28
STOP button 27
PLAY button 26
PAUSE button 27
SKIP buttons 32
ON/STANDBY button 26
OPEN/CLOSE button 26

Rear panel


VIDEO OUT (Y/PB/PR) (Component video) jacks 19
5.1CH SURROUND AUDIO OUT jacks 24
2CH AUDIO OUT jacks 19 20
AV (SCART) socket 18
VIDEO OUT jack 18 20
BITSTREAM/PCM COAXIAL AUDIO OUT jack 22 23 24
AC inlet
S VIDEO OUT jack 18 20
BITSTREAM/PCM OPTICAL AUDIO OUT jack 22 23 24
When connecting the optical digital cable, remove the cap and fit the connector into the jack firmly. When not using the jack, keep the cap inserted to protect it from dust intrusion.
Power cord

DVD display

■ **Repeated pressing of the FL DIMMER button on the remote control changes the brightness of the display.**

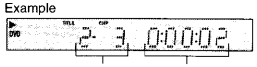


The indicators vary depending on the kinds of discs you play.

DVD video disc

- During playback:

Example



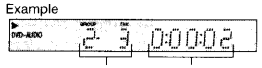
Playing chapter 3 of title 2 — **Elapsed time of the current title**

- Some discs may not display chapter numbers.
- A time indication not accompanied with a chapter number shows elapsed time of a segment within the current title.

DVD audio disc

- During playback:

Example

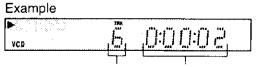


Playing track 3 of group 2 — **Elapsed time of the current group**

VIDEO CD

- During playback:

Example



Playing track 6 — **Elapsed time of the current track**

Some discs may not display track numbers or elapsed time.

Audio CD

- During playback:

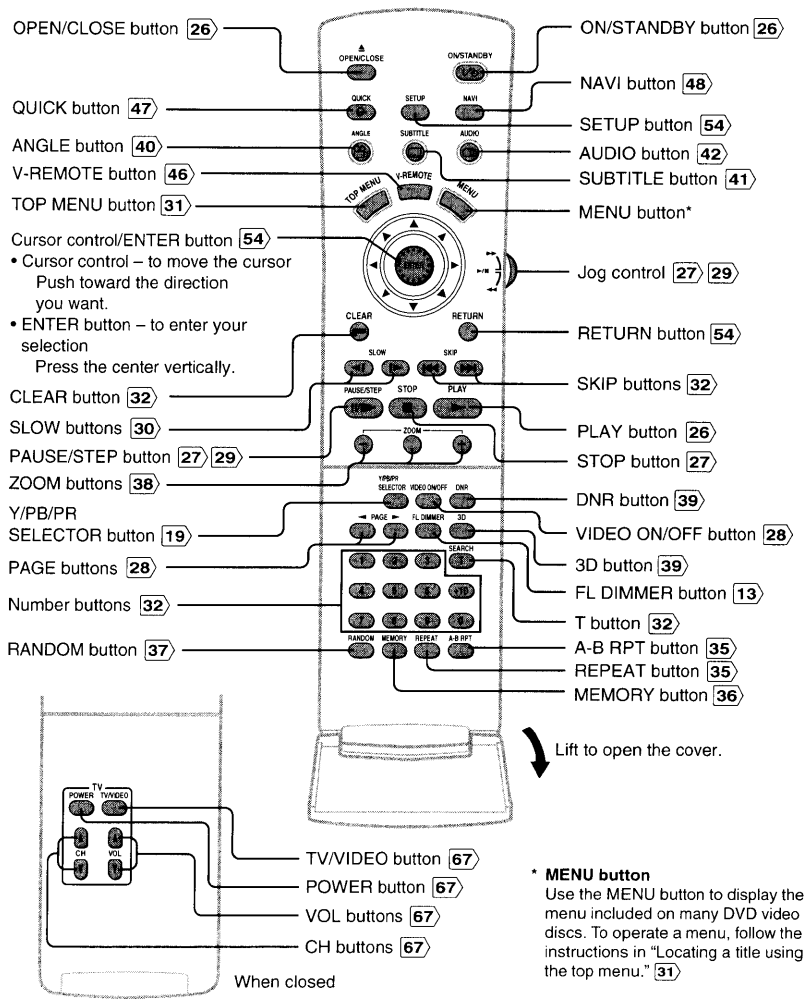
Example

Playing track 6 — **Elapsed time of the current track**

Identification of Controls (continued)

The instructions in this manual describe the functions on the remote control. See the page in ▭ for details.

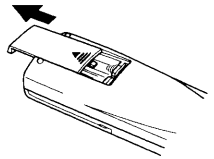
Remote control



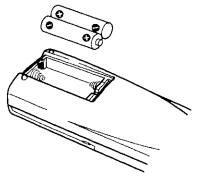
*** MENU button**
Use the MENU button to display the menu included on many DVD video discs. To operate a menu, follow the instructions in "Locating a title using the top menu." 31

Loading batteries

1 Open the cover.

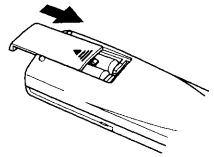


2 Insert batteries (R03 size).



Make sure to match the + and – on the batteries to the marks inside the battery compartment.

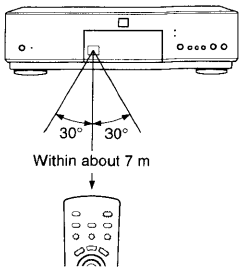
3 Close the cover.



Notes on batteries
Improper use of batteries may cause battery leakage and corrosion. To operate the remote control correctly, follow the instructions below.
- Do not insert batteries into the remote control in the wrong direction.
- Do not charge, heat, open, or short-circuit the batteries. Do not throw batteries into a fire.
- Do not leave dead or exhausted batteries in the remote control.
- Do not use different types of batteries together, or mix old and new batteries.
- If you do not use the remote control for a long period of time, remove the batteries to avoid possible damage from battery corrosion.
- If the remote control does not function correctly or if the operating range becomes reduced, replace all batteries with new ones.
- If battery leakage occurs, wipe the battery liquid from the battery compartment, then insert new batteries.

Operating with the remote control

Point the remote control at the remote sensor and press the buttons.



Distance: About 7 m from the front of the remote sensor
Angle: About 30° in each direction of the front of the remote sensor

* Do not expose the remote sensor of the DVD player to a strong light source such as direct sunlight or other illumination. If you do so, you may not be able to operate the DVD player via the remote control.

Notes on the remote control
- Direct the remote control at the remote sensor of the DVD player.
- Do not drop or give the remote control a shock.
- Do not leave the remote control near an extremely hot or humid place.
- Do not spill water or put anything wet on the remote control.
- Do not open the remote control.

1-7

Connections

Read this chapter first to make all necessary preparations.

- **Connecting to a TV (Using the SCART socket)**
- **Connecting to a TV (Using the component video jacks)**
- **Connecting to a TV (Using the phono type jacks)**
- **Connecting to an amplifier equipped with a Dolby Digital decoder**
- **Connecting to an amplifier equipped with Dolby Pro Logic Surround**
- **Connecting to an amplifier equipped with a DTS decoder**
- **Connecting to an amplifier equipped with an MPEG2 audio decoder**
- **Connecting to an amplifier equipped with 5.1ch audio inputs**
- **Connecting to an amplifier equipped with a digital audio input**

Connecting to a TV

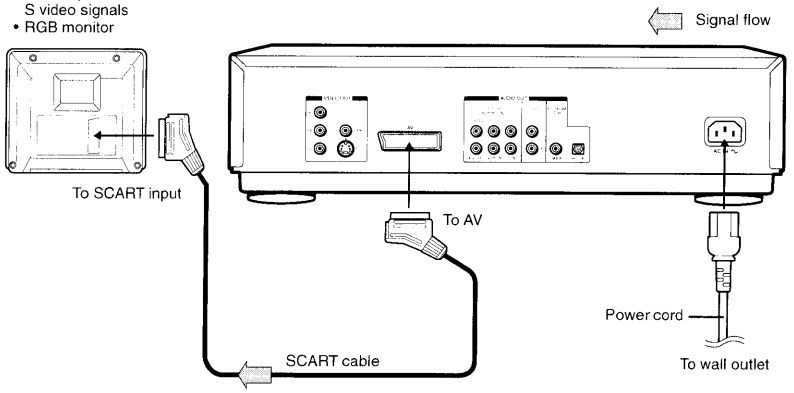
Connect the DVD player to your TV.

For details of output sound, see 43.

Connect the DVD player directly to your TV. If you connect the DVD player to a VTR, TV/VTR combination or video selector, the playback picture may be distorted as DVD video discs are copy protected.

Connecting to a TV (Using the SCART socket)

- Normal TV
- TV compatible with S video signals
- RGB monitor



- Make the following setting.

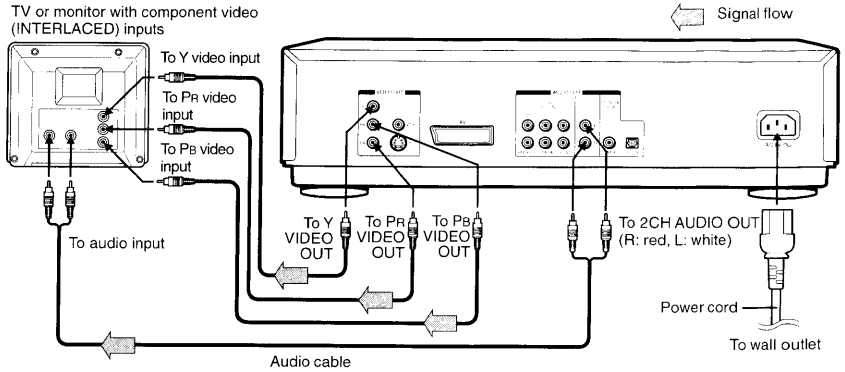
TV \ Setting	See "Customizing the Function Settings" beginning from 54.	
	"Video Out Select" 59	"Audio Out Select" 59
Normal TV	"Video"	"Analog 2ch"
TV compatible with S video signals	"S Video"	"Analog 2ch"
RGB monitor	"RGB"	"Analog 2ch"

Notes

- Refer to the owner's manual of the connected TV as well.
- When you connect the DVD player to your TV, be sure to turn off the power and unplug both units from the wall outlet before making any connections.

Connecting to a TV (Using the component video jacks)

TV or monitor with component video (PROGRESSIVE) inputs
or
TV or monitor with component video (INTERLACED) inputs



PROGRESSIVE (525P (480P)) outputs/inputs

Some TVs or monitors are equipped with component video inputs that are capable of reproducing a progressively scanned video signal. Connecting to these inputs allows you to view the high quality pictures with less flicker.

Notes

- To output video signals in the progressive format, set "PAL/Auto" to "Auto" 59.
- A VIDEO CD recorded in the PAL system cannot be viewed in the progressive output format. Video signals of those discs are output always in the interlaced output format.

INTERLACED outputs/inputs

Some TVs or monitors are equipped with component video inputs. Connecting to these inputs allows you to enjoy higher quality picture playback.
Actual labels for component video inputs may vary depending on the TV manufacturer. (ex. Y, R-Y, B-Y or Y, CB, CR)
In some TVs or monitors, the color levels of the playback picture may be reduced slightly or the tint may change. In such a case, adjust the TV or monitor for optimum performance.

■ To switch the output signal (Progressive/ Interlaced)

Press **Y/PB/PR SELECTOR** on the remote control during stop.
The output signal alternates between component progressive and component interlaced.

- Make the following setting.

TV \ Setting	See "Customizing the Function Settings" beginning from 54.	
	"Video Out Select" 59	"Audio Out Select" 59
TV or monitor with component video inputs	"Video" or "S Video"	"Analog 2ch"

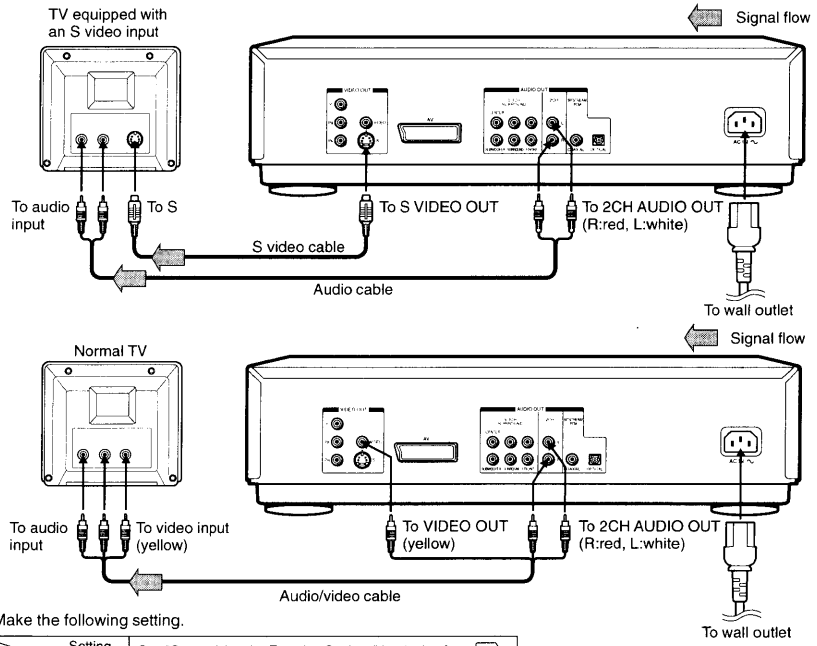
Notes

- Refer to the owner's manual of the connected equipment as well.
- When you connect the DVD player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- If you place the DVD player near a tuner or radio, the radio broadcast sound might be distorted. In this case, place the DVD player away from the tuner and radio.
- The output sound of the DVD player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD player's power cord. If you leave the amplifier power on, the speakers may be damaged.

Connecting to a TV (continued)

Connecting to a TV (Using the phono type jacks)

■ Select the connection type depending on the TV. (TV equipped with an S video input / Normal TV)



- Make the following setting.

TV \ Setting	See "Customizing the Function Settings" beginning from 54.	
	"Video Out Select" 59	"Audio Out Select" 59
TV equipped with an S video input	"S Video"	"Analog 2ch"
Normal TV	No need to set.	"Analog 2ch"

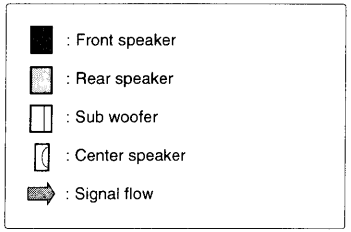
Notes

- Refer to the owner's manual of the connected equipment as well.
- When you connect the DVD player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- If your television set has one audio input, connect the DVD player to a Y cable adapter (not supplied) and then connect to your TV.
- If you place the DVD player near a tuner or radio, the radio broadcast sound might be distorted. In this case, place the DVD player away from the tuner and radio.
- The output sound of the DVD player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD player's power cord. If you leave the amplifier power on, the speakers may be damaged.

Connecting to Optional Equipment

You can enjoy high quality dynamic sounds by connecting the DVD player to optional audio equipment.

- For connection to your TV, see "Connecting to a TV" 18 – 20.
- For details of output sound, see 43.
- This section uses the following reference marks.



Notes

- DO NOT connect the BITSTREAM/PCM AUDIO OUT jack of the DVD player to the AC-3 RF input of a Dolby Digital Receiver. This input on your A/V Receiver is reserved for Laserdisc use only and is incompatible with the BITSTREAM/PCM AUDIO OUT jack of the DVD player.
- Connect the BITSTREAM/PCM AUDIO OUT jack of the DVD player to the "OPTICAL" or "COAXIAL" input of a Receiver or Processor.
- Refer to the owner's manual of the connected equipment as well.
- When you connect the DVD player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- The output sound of the DVD player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD player's power cord. If you leave the amplifier power on, the speakers may be damaged.

Warning

When you are connecting (via the BITSTREAM/PCM AUDIO OUT jack) an AV decoder that does not have Dolby Digital, Digital Theater Systems (DTS) or MPEG2 decoding function, be sure to set "Audio Out Select" to "PCM" from the on-screen displays 54 59. Otherwise, high volume sound may damage your hearing as well as the speakers.

■ To play DVD audio discs

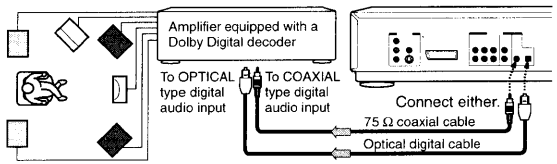
It is recommended that you connect your amplifier via the 2CH AUDIO OUT (L/R) jacks or the 5.1CH SURROUND AUDIO OUT jacks of the DVD player.
If you connect it via the BITSTREAM/PCM AUDIO OUT jack, you cannot obtain the full benefit of DVD audio sound.

Connecting to Optional Equipment (continued)

Connecting to an amplifier equipped with a Dolby Digital decoder

Dolby Digital
Dolby Digital is the surround sound technology used in theaters showing the latest movies, and is now available to reproduce this realistic effect in the home. You can enjoy motion picture and live concert DVD video discs with this dynamic realistic sound by connecting the DVD player to a 6 channel amplifier equipped with a Dolby Digital decoder or Dolby Digital processor. If you have a Dolby Pro Logic Surround decoder, you will obtain the full benefit of Pro Logic from the same DVD movies that provide full 5.1-channel Dolby Digital soundtracks, as well as from titles with the Dolby Surround mark.

Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories. Confidential unpublished works. ©1992-1997 Dolby Laboratories. All rights reserved.


Amplifier equipped with a Dolby Digital decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

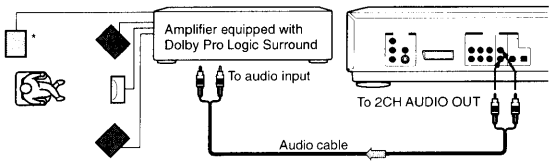
- Use DVD video discs encoded via the Dolby Digital recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	54 59
Recording system	DD D	42

Connecting to an amplifier equipped with Dolby Pro Logic Surround

Dolby Pro Logic Surround
You can enjoy the dynamic realistic sound of Dolby Pro Logic Surround by connecting an amplifier and speaker system (right and left front speakers, a center speaker, and one or two rear speakers).

- **With an amplifier equipped with Dolby Digital**
  Connect the equipment the same way as described in "Connecting to an amplifier equipped with a Dolby Digital decoder." Refer to that amplifier's owner's manual and set the amplifier so you can enjoy Dolby Pro Logic Surround sound.
- **With an amplifier not equipped with Dolby Digital**
  Connect the equipment as follows.



- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	54 59

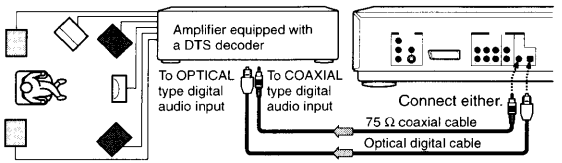
Be sure to set "Audio Out Select" to "Analog 2ch" when you enjoy sounds of Dolby Pro Logic Surround using this connection.

* Connect one or two rear speakers. The output sound from the rear speakers will be monaural even if you connect two rear speakers.

Connecting to an amplifier equipped with a DTS decoder

Digital Theater Systems (DTS)
DTS is a high quality surround technology used in theaters and now available for home use, on DVD video discs or audio CDs.
If you have a DTS decoder or processor, you can obtain the full benefit of 5.1 channel DTS encoded sound tracks on DVD video discs or audio CDs.

Manufactured under license from Digital Theater Systems, Inc. US Pat. No. 5,451,942, 5,956,674, 5,974,380, 5,978,762 and other world-wide patents issued and pending. "DTS" and "DTS Digital Surround" are registered trademarks of Digital Theater Systems, Inc. ©1996, 2000 Digital Theater Systems, Inc. All Rights Reserved.

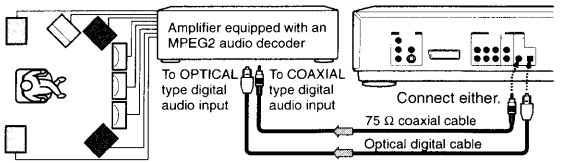

Amplifier equipped with a DTS decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

- Use DVD video discs or audio CDs encoded via the DTS recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	54 59
Recording system	DTS	42

Connecting to an amplifier equipped with an MPEG2 audio decoder

MPEG2 sound
You can enjoy motion picture and live concert DVD video discs with dynamic realistic sound by connecting an amplifier equipped with an MPEG2 audio decoder or MPEG2 audio processor.


Amplifier equipped with an MPEG2 audio decoder
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

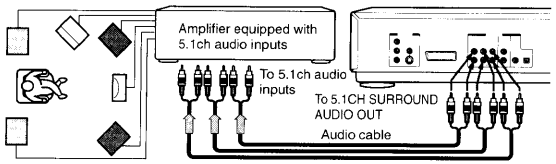
- Use DVD video discs encoded via the MPEG2 recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	54 59
Recording system	MPEG	42

Connecting to Optional Equipment (continued)

Connecting to an amplifier equipped with 5.1ch audio inputs

5.1ch surround sound
The Dolby Digital, DTS and MPEG2 decoders equipped with this DVD player enable you to obtain the full benefit of 5.1 channel sound tracks when you connect the DVD player to an amplifier equipped with 5.1 channel audio inputs.



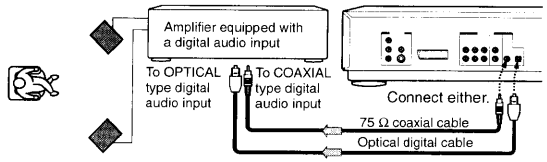
- Use DVD video discs encoded via the Dolby Digital recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 6ch"	54, 59
Recording system	D DTS MPEG	42

2 channel sound is output in the Dolby Pro Logic format. To obtain the original 2 channel sound, select "Analog 2ch."

Connecting to an amplifier equipped with a digital audio input

2 channel digital stereo
You can enjoy the dynamic sound of 2 channel digital stereo by connecting an amplifier equipped with a digital audio input and speaker system (right and left front speakers).


Amplifier equipped with a digital audio input
To OPTICAL type digital audio input
To COAXIAL type digital audio input
Connect either.
75 Ω coaxial cable
Optical digital cable

- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"PCM"	54, 59

1-12

Basic playback

Begin your operation.

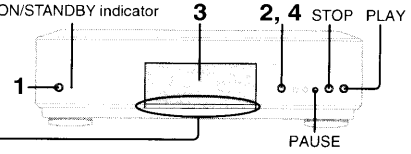
- **Playing a Disc**
- **Variable Speed Playback**
- **Locating a Desired Section**

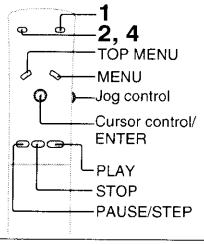
Playing a Disc

This section shows you the basics on how to play a disc.

CAUTION
Keep your fingers well clear of the disc tray as it is closing. Neglecting to do so may cause serious personal injury.

Do not give an upward force to the disc tray or put an object under. Doing so may damage the disc tray mechanism, causing the DVD player to malfunction.





■ **To obtain a higher quality picture**
Occasionally, some picture noise not usually visible during a normal broadcast may appear on the TV screen while playing a DVD video disc because the high resolution pictures on these discs include a lot of information. While the amount of noise depends on the TV you use with this DVD player, you should generally reduce the sharpness adjustment on your TV when viewing DVD video discs.

■ **About** DVD-V DVD-A VCD CD
The DVD-V DVD-A VCD CD icons on the heading bar show the playable discs for the function described under that heading.

DVD-V : DVD video discs
DVD-A : DVD audio discs
VCD : VIDEO CDs
CD : Audio CDs

DVD-V DVD-A VCD CD Basic playback

Preparations
- When you want to view a disc, turn on the TV and select the video input connected to the DVD player.
- When you want to enjoy the sound of discs from the audio system, turn on the audio system and select the input connected to the DVD player.

1 Press ON/STANDBY.

ON/STANDBY

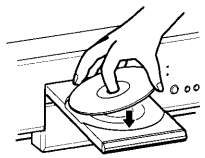
The DVD player turns on.
The ON/STANDBY indicator on the player shows the status as follows:
Green: in operation
Red: standby mode

When the DVD player is turned on for the first time, a message appears. Press ENTER, and make the proper settings before proceeding to step 2. 65

2 Press OPEN/CLOSE.

▲OPEN/CLOSE The disc tray opens.

3 Place a disc on the disc tray.



With the playback side down.

- There are two different disc sizes. Place the disc in the correct guide on the disc tray. If the disc is out of the guide, it may damage the disc and cause the DVD player to malfunction.
- Do not place a disc which is unplayable in this DVD player.

4 Press OPEN/CLOSE to close the disc tray.

▲OPEN/CLOSE

Playback starts.

DVD-V If you insert a DVD video disc that contains a top menu, a menu may appear. See "Locating a title using the top menu." 31
You may need to press the TOP MENU or MENU button to display disc menu (depending on the actual DVD video disc.)
DVD-A A menu may appear depending on the disc. See "Locating a title using the top menu" 31.

Note
If the disc tray contains a disc you have already played, playback will begin from the location where you last stopped playback. 30

■ **To start playback in the stop mode**
Press **PLAY**.

►PLAY

■ **To pause playback (still mode)**
Press **PAUSE/STEP** during playback.

PAUSE/STEP

To resume normal playback, press the PLAY button.

Alternatively press the **jog control** during normal playback.

To resume normal playback, press the jog control again.

- Sound is muted during still mode.

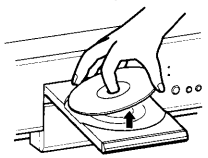
■ **To stop playback**
Press **STOP**.

STOP

■ **To remove the disc**
Press **OPEN/CLOSE**.

▲ OPEN/CLOSE

Remove the disc after the disc tray opens completely.



Be sure to press the OPEN/CLOSE button to close the disc tray after you remove the disc.

■ **About the screen saver**
If you pause a picture of a DVD video disc and leave it still for a long while, the screen saver of the DVD player automatically appears (when "Screen Saver" is set to "On" 63). To turn off the screen saver, press the PLAY button.

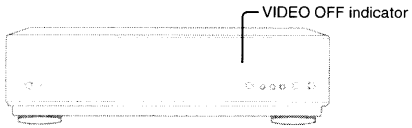
■ **Automatic Power Off function**
If the DVD player is stopped, or the screen saver is engaged for approximately 20 minutes, the DVD player will automatically turn itself off.

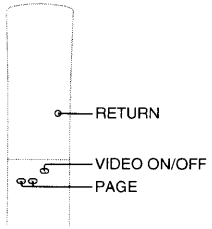
■ **HDCD (High Definition Compatible Digital®)**
HDCD® (High Definition Compatible Digital®) is a recording system that has improved audio CD sound in dynamic range, sound field reproducibility and vocal acoustics.
This DVD player is equipped with an HDCD decoder. The HDCD indicator illuminates when playing an HDCD-encoded audio CD.

HDCD®, HDCD®, High Definition Compatible Digital® and Pacific Microsonics™ are either registered trademarks or trademarks of Pacific Microsonics, Inc. in the United States and/or other countries. HDCD system manufactured under license from Pacific Microsonics, Inc. This product is covered by one or more of the following patents: In the USA: 5,479,168, 5,638,074, 5,640,161, 5,808,574, 5,838,274, 5,854,600, 5,864,311, 5,872,531, and in Australia: 669114. Other patents pending.

Notes
- Do not move the DVD player during playback. Doing so may damage the disc.
- Use the OPEN/CLOSE button to open and close the disc tray. Do not push the disc tray while it is moving. Doing so may cause the DVD player to malfunction.
- Do not push up on the disc tray or put any objects other than discs on the disc tray. Doing so may cause the DVD player to malfunction.
- In many instances, a menu screen will appear after playback of a movie is completed. Prolonged display of an on-screen menu may damage your television set, permanently etching that image onto its screen. To avoid this, be sure to press the STOP button on your remote control once the movie is completed.

Playing a Disc (continued)





Basic playback (continued)

■ Still pictures included on DVD audio discs

DVD audio discs may include still pictures, which are classified into two large groups.

- Slideshow: Still pictures appear one after another automatically consistent with the disc program. They cannot be operated.
- Browsable pictures: You can display your favorite still picture selected with the buttons on the remote control. Some of those may change automatically.

◄ PAGE ► : To select a picture. (The order of pictures vary depending on the disc)

RETURN : To return to a specific one programmed on the disc.

■ VIDEO ON/OFF button

The DVD player can be set playing audio exclusively. In this case, you can obtain sound of better quality, as the DVD player does not process video signals. (All the video output jacks send no video signals.)

Press **VIDEO ON/OFF** repeatedly to set the VIDEO OFF indicator as follows.

VIDEO ON/OFF

VIDEO OFF

Lit : The DVD player plays audio signal only. You can obtain sound of better quality.

Off : The DVD player plays both video and audio signal.

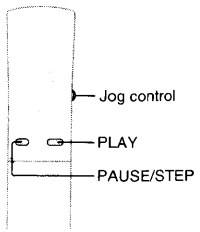
Note

Some DVD audio discs may allow you to make selections on the screen. To operate them, turn off the VIDEO OFF indicator so that video signals can be played.

1-14

Variable Speed Playback

You can play discs at various speeds, and resume playback from the location where you stopped playback.



DVD-V DVD-A VCD CD Playing in fast reverse or fast forward directions

During normal playback, move the jog control toward ►► or ◄◄.

◄◄ : Fast reverse playback
►► : Fast forward playback

Each time you move the jog control up or down, the playback speed changes.

■ To resume normal playback

Press **PLAY** or press the **jog control**.

PLAY

Notes

- The DVD player mutes sound and omits subtitles during reverse and forward scan of DVD video discs.
- DVD audio discs may not be played in fast reverse or fast forward directions.
- The playback speed may differ depending on the disc.

DVD-V VCD Playing frame by frame

Press PAUSE/STEP during still playback.

PAUSE/STEP

Each time you press the PAUSE/STEP button, the picture advances one frame.

■ To resume normal playback

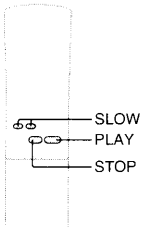
Press **PLAY**.

PLAY

Notes

- The sound is muted during frame by frame playback.
- When using a DVD audio disc that includes pictures, this operation may be permitted in some picture segments.

Variable Speed Playback (continued)



Playing in slow-motion

Press SLOW during playback.

SLOW

Each time you press the SLOW I► button, the slow-motion speed changes.

SLOW

If you press the SLOW ◄I button during playback, you can view the picture in reverse slow-motion. (Only when using a DVD video disc.)

Each time you press the SLOW ◄I button, the slow-motion speed changes.

■ To resume normal playback

Press **PLAY**.

PLAY

Notes

- The sound is muted during slow-motion playback.
- The playback speed may differ depending on the disc.
- When using a DVD audio disc that includes pictures, this operation may be permitted in some picture segments.

Resuming playback from the same location

1 Press STOP at the location where you want to interrupt playback.

STOP

The DVD player memorizes the location where playback is stopped.

2 Press PLAY.

PLAY

The DVD player resumes playback from the location where you stopped playback.

■ To start playback from the beginning regardless of the location where you stopped playback

1 Press **STOP** twice.

STOP

The DVD player's memory is cleared.

2 Press **PLAY**.

PLAY

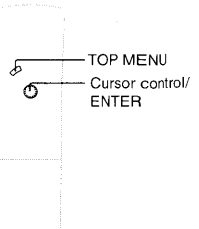
DVD-V Playback starts from the beginning of the current title.
DVD-A Playback starts from the beginning of the current group.
VCD CD Playback starts from the beginning of the disc.

- If you want to return to the beginning of a DVD video/ audio disc, open and close the disc tray once with the OPEN/CLOSE button before pressing the PLAY button.

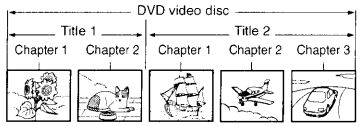
Notes

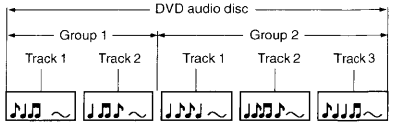
- The DVD player's memory is also cleared when:
  - –you unplug the DVD player from the wall outlet after you stop playback.
  - –you change the parental lock setting 63 or select a disc menu language 61.
  - –you open the disc tray.
- There may be a difference in the location where playback resumes depending on the disc. Especially when using a DVD audio disc, playback may resume from the beginning of the current track.
- Settings you changed using the on-screen displays while the DVD player keeps a location in the memory may function only after the memory is cleared.

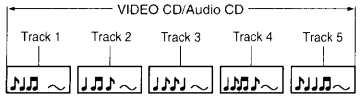
Locating a Desired Section



Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. DVD audio discs are divided into groups, and the groups are sub-divided into tracks. VIDEO CDs and audio CDs are divided into tracks. You can quickly locate any specific title, chapter, group, or track.







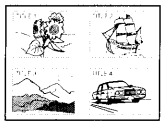
Locating a title using the top menu

1 Press TOP MENU.

TOP MENU

The top menu appears on the TV screen.

e.g.



2 Select the title you want moving the cursor control.

If the titles in the top menu are assigned a number, you can directly locate a specific title by pressing its designated number with the number buttons.

3 Press ENTER.

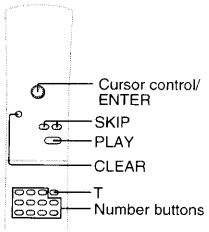
ENTER

Playback starts from chapter 1 of the selected title.

Notes

- The instructions above describe basic procedures which may vary depending on the contents of the DVD video disc. If different instructions appear on the TV screen, follow those instructions.
- If you display the top menu during playback and press the TOP MENU button again without selecting any title, the DVD player may resume playback from the point where you first pressed the TOP MENU button (depending on the actual DVD video disc.)
  When using a DVD audio disc, the DVD player resumes playback from the beginning of the track where you pressed the TOP MENU button.
- This method of locating a title is available only on a disc that contains a top menu.
- Instruction notes of discs may refer to the button that displays the top menu as TITLE button.

Locating a Desired Section (continued)



DVD-V DVD-A VCD CD Locating a desired section by entering the corresponding number

1 Press T.

Skip steps 1 and 2 if you are using a VIDEO CD/ audio CD.
The following display appears.

SEARCH (T)

e.g.

DVD-V	DVD-A
Title: 1 Chapter: 1	Group: 1 Track : 1

2 Move the cursor control to select a section you want to locate.

▲
▼

e.g. When you want to locate a chapter or track.

e.g.

DVD-V	DVD-A
Title: 1 Chapter: 1	Group: 1 Track : 1

3 Press the corresponding number buttons for the section you want.

e.g. To select chapter or track 25

(2) → (5)

or

(+10) → (+10) → (5)

4 Repeat steps 2 and 3 if necessary.

5 Press PLAY.

PLAY (►) Playback starts from the selected section.

Notes

- Pressing the CLEAR button resets the numbers. To clear the display, press the T button several times.
- This method of locating a title/group is available only on a disc that contains title/group numbers.

■ Playing bonus groups of DVD audio discs

Some DVD audio discs may include an extra content called "Bonus group".
If you select it to play, a display appears to enter a key number. Press the number buttons to enter the key number, then press ENTER.
When the number is entered correctly, playback of the bonus group starts.
To get key numbers, refer to instruction notes of discs.

Notes

- A key number may be cleared in some cases such as when removing the disc. Enter the key number again if necessary.
- When you use a bonus group in a programmed play such as memory playback, enter the key number beforehand.

DVD-V DVD-A VCD CD Locating a specific chapter or track

Press SKIP I◄◄ or ►►I repeatedly to display the chapter or track number you want.

Playback starts from the selected chapter or track.

SKIP (►►I) To locate succeeding chapters or tracks.

SKIP (I◄◄) Playback starts from the beginning of the current chapter or track.
When you press twice, playback starts from the beginning of the preceding chapter or track.

Notes

- Some titles may not display chapter numbers.
- When you set "Title/Group Stop" to "Off" (65), you can access chapters in another title. If you go back to the preceding title by pressing the SKIP I◄◄ button, the DVD player locates the first chapter of the title. When "Title/Group Stop" is set to "On," you can access chapters only within the current title.
- If you press and hold the SKIP I◄◄ or ►►I button on the front panel during playback, the DVD player performs fast reverse or fast forward playback. You can vary the speed by pressing the button further.
To locate chapters or tracks during fast reverse or fast forward playback, first press the PLAY button to resume normal playback, then use the SKIP I◄◄ or ►►I button.

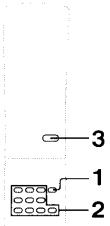
Advanced playback

Customizing the performance of your DVD player.

- **Accessing a Specific Location Directly**
- **Playing Repeatedly**
- **Playing in a Favorite Order**
- **Playing in Random Order**
- **Zooming a Picture**
- **Selecting 3D DNR Picture Enhancement**
- **Selecting 3-D (N-2-2) Sound Enhancement**
- **Selecting the Camera Angle**
- **Selecting Subtitles**
- **Selecting a Language**

Accessing a Specific Location Directly

You can access a specific location by entering its corresponding time (hours, minutes, seconds).



DVD-V VCD CD Entering the time of the desired location

1 Press T twice.

SEARCH (T)

You may have to press further depending on the disc. Press the button repeatedly until the following display appears.

Time -:--:--

2 Press the number buttons to enter the time.

e.g. (1)-(2)-(5)-(3)-(0)

Time 1:25:30

3 Press PLAY.

PLAY

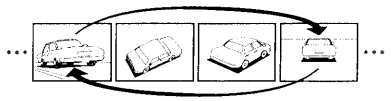
Playback starts from the desired location.

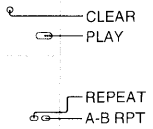
Notes

- Some discs may not respond to this process.
- Some scenes may not be located precisely as you specified.
- This method for accessing specific locations is available only within the current title of the DVD video disc or within the current track of the VIDEO CD/audio CD.

Playing Repeatedly

You can play a specific title, chapter, group, track, or segment repeatedly.





DVD-V DVD-A VCD CD Repeating a title, chapter, group or track

1 Press REPEAT.

REPEAT

Each time you press the REPEAT button, the repeat mode changes as follows.

Chapter Repeat

DVD-V	Chapter Repeat	Repeats the current chapter.
DVD-A	Track Repeat	Repeats the current track.
DVD-V	Title Repeat	Repeats the current title.
DVD-A	Group Repeat	Repeats the current group.
VCD	Track Repeat	Repeats the current track.
CD	Track Repeat	Repeats the current track.
DVD-V DVD-A VCD CD	All Repeat	Repeats the entire disc.
	Repeat Off	Resumes normal playback.

2 Press PLAY.

PLAY

The DVD player starts repeat playback.
Press the PLAY button within about 5 seconds after you press the REPEAT button.

■ To resume normal playback

Press **CLEAR**.

CLEAR

Note

Some discs may not permit repeat operation.

DVD-V VCD CD Repeating a specific segment

1 Press A-B RPT at the beginning of the segment (point A) you want to play repeatedly.

A-B RPT

A-

2 Press A-B RPT again at the end of the segment (point B).

A-B RPT

The DVD player automatically returns to point A and starts repeat playback of the selected segment (A-B).

A-B

■ To resume normal playback

Press **CLEAR**.

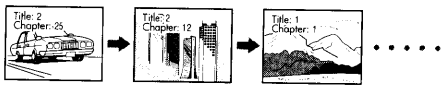
CLEAR

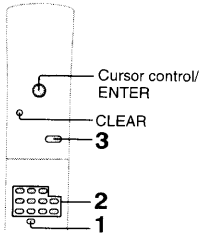
Notes

- Some discs may not permit A-B repeat operation.
- You cannot set the A-B repeat function for a segment that includes multiple camera angles (40).
- You can specify a segment only within the current title or track.
- There may be a slight difference between point A and the location where playback actually resumes depending on the disc.

Playing in a Favorite Order

You can combine your favorite titles, chapters, group, or tracks and play them in the order you determine. You can program up to 30 selections into the memory. (Memory playback)





DVD-V DVD-A VCD CD Setting titles, chapters, group or tracks in a favorite order

1 Insert a disc and press MEMORY during stop.

MEMORY

The following display appears.

TG: Title number or group number
CT: Chapter number or track number

2 Select the items in the order you want by pressing the number buttons, then ENTER for each item.

Each time you move the cursor control (◄ / ►), the spaces of "TG" and "CT" are highlighted in turn. Highlight where you want to enter, then press the corresponding number buttons.

To select tracks from a VIDEO CD/audio CD in order, press the **number buttons** for the track, then press the **ENTER** button for each selection you want.

Note

The space of "TG" may be showing a number. Neglect this number when using a VIDEO CD/audio CD.

To select another chapter in the same title, you do not need to select the title number.
To select another track in the same group, you do not need to select the group number.

3 Press PLAY while the "Memory List" display appears on the TV screen.

PLAY

The DVD player starts memory playback.

■ To change the programmed selections

1 While the "Memory List" display appears on the TV screen, move the cursor control (▲ / ▼) to highlight the item you want to change.
2 Change the selection following the instructions in step **2**.

■ To cancel the programmed selections

1 While the "Memory List" display appears on the TV screen, move the cursor control (▲ / ▼) to highlight the item you want to cancel.
2 Press **CLEAR**.

■ To resume normal playback from memory playback

Press **CLEAR**.

CLEAR

The memory playback indicator disappears.

■ To program during playback

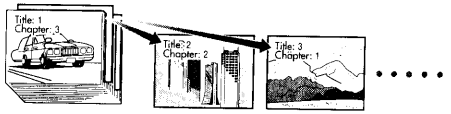
If you press the **MEMORY** button during playback, a programming display appears.
Follow steps **2** and **3**.

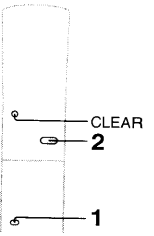
Notes

- Some discs may not permit memory playback operation.
- If you press the REPEAT button during memory playback, the DVD player repeats the current memory playback.
- If you press the MEMORY or RETURN button while the "Memory List" display appears on the TV screen, the "Memory List" display disappears.
- The programmed selections will be cleared when you turn off the DVD player.

Playing in Random Order

You can play titles, chapters within a title or tracks in random order. (Random playback)





DVD-V VCD CD Playing titles, chapters or tracks in random order

1 Press RANDOM.

RANDOM

Each time you press the RANDOM button, the random playback mode changes as follows.

Chapter Random

- DVD-V Chapter Random — Plays the chapters within the current title in random order.
- DVD-V Title Random — Plays the titles in random order.
- VCD Track Random — Plays the tracks in random order.
- CD Track Random — Plays the tracks in random order.
- Random Off — Resumes normal playback.

If you press the RANDOM button during playback, the DVD player automatically starts random playback after finishing the current title, chapter or track.

2 Press PLAY.

PLAY

The DVD player starts random playback.
Press the PLAY button within about 5 seconds after you press the RANDOM button.

■ To resume normal playback

Press **CLEAR**.

CLEAR

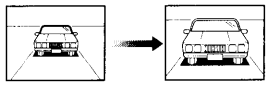
Notes

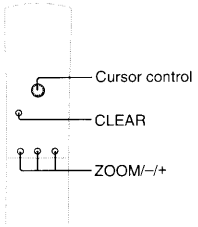
- Some discs may not permit random playback operation.
- You cannot use the random playback function in conjunction with the memory playback function.

1-18

Zooming a Picture

You can magnify areas within a picture.





DVD-V Zooming a picture

1 Press ZOOM during normal, slow or still playback.

ZOOM — Zoom playback starts.

2 Select the zoom point and magnification level.

⊕ — To increase the magnification level.

⊖ — To reduce the magnification level.

As you move the cursor control, the zoom point shifts.

CLEAR — Pressing the CLEAR button restores the zoom point to the center of the picture.

■ **To resume normal playback**

Press **ZOOM** repeatedly so that "Zoom Off" appears.

ZOOM

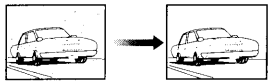
Notes

- Some discs may not respond to zoom feature.
- During some scenes, the buttons may not work as described.
- Zooming does not work on subtitles or menus included on DVD video discs.
- During zoom playback, the cursor control cannot work on menus included on DVD video discs. If you want to view the menus, cancel the zoom playback.
- The magnification level varies depending on the picture size you select. 57
- When using a DVD audio disc that includes pictures, this operation may be permitted in some picture segments.

1-19

Selecting 3D DNR Picture Enhancement

You can view a picture with less video noise.

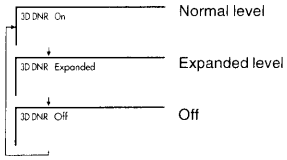


DVD-V VCD Selecting 3D DNR picture enhancement

Press DNR during playback.

DNR — The current setting is displayed.

Each time you press the DNR button, the setting changes as follows.



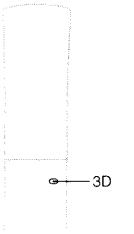
3D DNR: Three Dimension Digital Noise Reduction

Notes

- Actual picture enhancement may vary depending on the quality of the disc.
- While the expanded level can provide additional improvement in the reduction of noise in the video signal, it may produce undesirable picture artifacts on some discs. Should this occur, select a more appropriate DNR level (normal or off).
- Depending on the disc, some kinds of picture details may be lost by the picture enhancement.
- When using a DVD audio disc that includes pictures, this operation may be permitted in some picture segments.

Selecting 3-D (N-2-2) Sound Enhancement

You can enjoy expansive virtual surround sound effects from just two speakers.

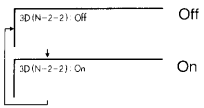


DVD-V VCD CD Selecting 3-D (N-2-2) sound enhancement

Press 3D during playback.

3D — The current setting is displayed.

Each time you press the 3D button, the setting changes as follows.



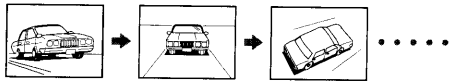
Notes

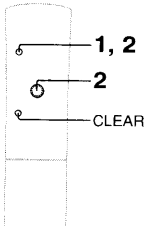
- You may sense a difference in volume between normal and 3-D (N-2-2) enhanced sound.
- 3-D (N-2-2) sound enhancement may not function (or may not be realized) depending on the sound output setting or recording system 43.
- If 3-D (N-2-2) sound enhancement is on, Dolby Pro Logic Surround may not function on output sounds at all, or may function differently than usual.

Spatializer® 3-Dimensional Sound Processing provided by Desper Products. Inc.
Certain audio features of this product manufactured under a license from Desper Products, Inc., Spatializer® and the circle-in-square device are trademarks owned by Desper Products, Inc.

Selecting the Camera Angle

If the scene was recorded from multiple angles, you can easily change the camera angle of the scene you are watching.





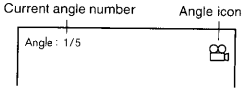
DVD-V Changing the camera angle

1 Press ANGLE while playing a scene recorded with multiple angles.

ANGLE

While playing a scene recorded with multiple angles, the angle icon appears in the DVD display and on the TV screen.
Press the ANGLE button while the angle icon is displayed.

e.g.



2 Press ANGLE or move the cursor control (▲) while the angle number is displayed on the TV screen.

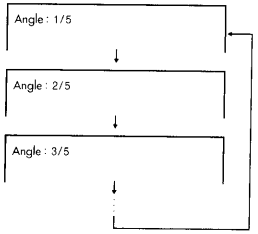
ANGLE

Each time you press the ANGLE button or move the cursor control (▲), the camera angle changes.

▲

▼

e.g.



▼ : Cycles backwards

You can change the camera angle directly by pressing the number buttons corresponding to its angle number instead of moving the cursor control (▲/▼).

■ To turn off the angle number display

Press **CLEAR**.

CLEAR

■ To disable the angle icon display on the TV

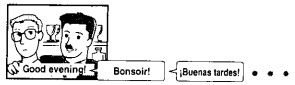
From the on-screen displays, set "On-Screen Displays" to "Off." 63
Monitor the DVD display when you want to change the camera angle.

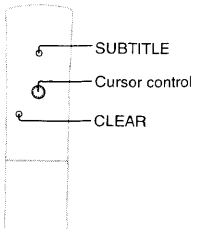
Notes

- You can change the camera angle during still playback. The camera angle changes to the new setting when you resume normal playback.
- If you pause a picture immediately after changing a camera angle, the resumed playback picture may not display the new camera angle.
- When using a DVD audio disc that includes pictures recorded from multiple angles, this operation may be permitted in some picture segments.

Selecting Subtitles

You can display subtitles on the TV screen and select a subtitle language from those included on the DVD video disc.



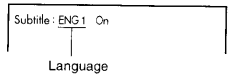


DVD-V Selecting a subtitle language

1 Press SUBTITLE during playback.

SUBTITLE

The current subtitle setting is displayed.



The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. 66

2 Press SUBTITLE or move the cursor control (▲) while the subtitle setting is displayed on the TV screen.

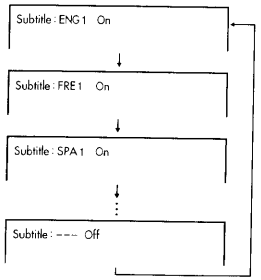
SUBTITLE

▲

▼

Each time you press the SUBTITLE button or move the cursor control (▲), the subtitle languages included on the DVD video disc change.

e.g.



▼ : Cycles backwards

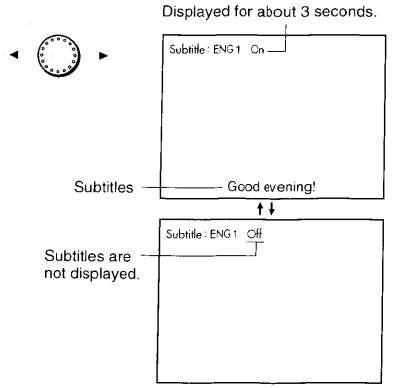
To turn off the subtitle setting display, press the CLEAR button.

■ To turn subtitles on or off

1 Press **SUBTITLE** during playback.

SUBTITLE

2 Move the cursor control (◄/►) while the subtitle setting is displayed on the TV screen, to select "On" or "Off."



Notes

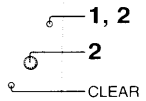
- Some DVD video discs are set to display subtitles automatically, and you cannot turn them off even if you set the subtitle function to off.
- During some scenes, the subtitles may not appear immediately after you select "On."
- Some DVD video discs will allow you to make subtitle selections and turn subtitles on or off only via the disc menu.

Notes

- When you turn on the DVD player or replace a disc, the player returns to the initial default setting 62.
  When you select a subtitle language which is not included on the disc, the DVD player plays a prior language programmed on the disc.
- During some scenes, the subtitles may not appear immediately after you change the subtitle language by moving the cursor control (▲/▼).
- When using a DVD audio disc that includes pictures accompanied with subtitles, this operation may be permitted in some picture segments.

Selecting a Language

You can select a preferred language and sound recording system from those included on the DVD video disc.



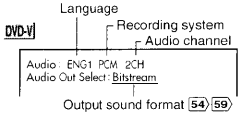
DVD-V DVD-A VCD Selecting a playback audio setting

1 Press AUDIO during playback.

AUDIO

The current audio setting is displayed.

e.g. DVD-V



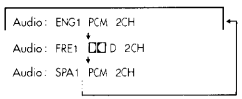
The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. 66

2 Press AUDIO or move the cursor control (▲) while the audio setting is displayed on the TV screen.

AUDIO

Each time you press the AUDIO button or move the cursor control (▲), the audio settings included on the DVD video disc change.

e.g. DVD-V



- ▼ : Cycles backwards
- If you move the cursor control (◄ / ►), you can select output sound format. 59
  When using a DVD audio disc, this operation may not be available.

To turn off the audio setting display, press the CLEAR button.

■ Selecting sound channels of VIDEO CDs

You can switch left and right channels by pressing the **AUDIO** button repeatedly during playback.

AUDIO

Notes

- When you turn on the DVD player or replace a disc, player returns to the initial default setting 62.
  If you select a sound track which is not included on the disc, the DVD player plays a prior sound track programmed on the disc.
- Some discs allow you to change audio selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate language from the selections on the disc menu.
- Some DVD audio discs may show the sampling frequency and bit of the sound recording system used on the disc.
- When you change the audio setting during playback of a DVD audio disc, playback may return to the beginning of the current track.

■ Output sound conversion table (sampling frequency/quantization bit)

Discs	Sound recording system		Audio selection from the menu 54 59 and output jacks on the rear panel							
			"Bitstream"		"Analog 6ch"		"Analog 2ch"		"PCM"	
			BITSTREAM/PCM jack	2CH AUDIO OUT jacks	BITSTREAM/PCM jack	5.1CH SURROUND AUDIO OUT jacks	BITSTREAM/PCM jack	2CH AUDIO OUT jacks	BITSTREAM/PCM jack	2CH AUDIO OUT jacks
DVD video discs	Dolby Digital		Bitstream	**48 kHz/20 bit**	–	48 kHz/20 bit	Bitstream	**48 kHz/20 bit**	**48 kHz/16 bit**	**48 kHz/20 bit**
	Linear PCM	48 kHz/16 bit	**48 kHz/16 bit**	**48 kHz/16 bit**	48 kHz/16 bit	48 kHz/16 bit	**48 kHz/16 bit**	**48 kHz/16 bit**	**48 kHz/16 bit**	**48 kHz/16 bit**
		48 kHz/20 bit	**48 kHz/16 bit**	**48 kHz/20 bit**	48 kHz/16 bit	48 kHz/20 bit	**48 kHz/16 bit**	**48 kHz/20 bit**	**48 kHz/16 bit**	**48 kHz/20 bit**
		48 kHz/24 bit	**48 kHz/16 bit**	**48 kHz/24 bit**	48 kHz/16 bit	48 kHz/20 bit	**48 kHz/16 bit**	**48 kHz/24 bit**	**48 kHz/16 bit**	**48 kHz/24 bit**
		96 kHz/16 bit	**48 kHz/16 bit**	**48 kHz/16 bit**	48 kHz/16 bit	48 kHz/16 bit	–	**96 kHz/16 bit**	**48 kHz/16 bit**	**48 kHz/16 bit**
		96 kHz/20 bit	**48 kHz/16 bit**	**48 kHz/20 bit**	48 kHz/16 bit	48 kHz/20 bit	–	**96 kHz/20 bit**	**48 kHz/16 bit**	**48 kHz/20 bit**
		96 kHz/24 bit	**48 kHz/16 bit**	**48 kHz/24 bit**	48 kHz/16 bit	48 kHz/20 bit	–	**96 kHz/24 bit**	**48 kHz/16 bit**	**48 kHz/24 bit**
	DTS		Bitstream	–	–	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
	MPEG2		Bitstream	**48 kHz/16 bit**	–	48 kHz/16 bit	Bitstream	**48 kHz/16 bit**	**48 kHz/16 bit**	**48 kHz/16 bit**
VIDEO CDs	MPEG1		**44.1 kHz/16 bit**	**44.1 kHz/16 bit**	–	44.1 kHz/16 bit	**44.1 kHz/16 bit**	**44.1 kHz/16 bit**	**44.1 kHz/16 bit**	**44.1 kHz/16 bit**
Audio CDs	Linear PCM 44.1 kHz/16 bit		44.1 kHz/16 bit	**44.1 kHz/16 bit**	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	**44.1 kHz/16 bit**	44.1 kHz/16 bit	**44.1 kHz/16 bit**
	HDCD		44.1 kHz/16 bit	**44.1 kHz/20 bit**	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	**44.1 kHz/20 bit**	44.1 kHz/16 bit	**44.1 kHz/20 bit**
	DTS		Bitstream	–	–	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit
DVD audio discs	Linear PCM or Packed PCM	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	–	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
		48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	–	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	–	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit
		48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	–	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		44.1 kHz/24 bit	44.1 kHz/16 bit	44.1 kHz/24 bit	–	44.1 kHz/24 bit	44.1 kHz/16 bit	44.1 kHz/24 bit	44.1 kHz/16 bit	44.1 kHz/24 bit
		48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	–	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
		88.2 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	–	88.2 kHz/16 bit	–	88.2 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
		96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	–	96 kHz/16 bit	–	96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		88.2 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	–	88.2 kHz/20 bit	–	88.2 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit
		96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	–	96 kHz/20 bit	–	96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		88.2 kHz/24 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	–	88.2 kHz/24 bit	–	88.2 kHz/24 bit	44.1 kHz/16 bit	44.1 kHz/20 bit
		96 kHz/24 bit	48 kHz/16 bit	48 kHz/20 bit	–	96 kHz/24 bit	–	96 kHz/24 bit	48 kHz/16 bit	48 kHz/20 bit
		• 176.4 kHz/16 bit	–	176.4 kHz/16 bit	–	176.4 kHz/16 bit	–	176.4 kHz/16 bit	–	176.4 kHz/16 bit
		• 192 kHz/16 bit	–	192 kHz/16 bit	–	192 kHz/16 bit	–	192 kHz/16 bit	–	192 kHz/16 bit
		• 176.4 kHz/20 bit	–	176.4 kHz/20 bit	–	176.4 kHz/20 bit	–	176.4 kHz/20 bit	–	176.4 kHz/20 bit
		• 192 kHz/20 bit	–	192 kHz/20 bit	–	192 kHz/20 bit	–	192 kHz/20 bit	–	192 kHz/20 bit
		• 176.4 kHz/24 bit	–	176.4 kHz/24 bit	–	176.4 kHz/24 bit	–	176.4 kHz/24 bit	–	176.4 kHz/24 bit
		• 192 kHz/24 bit	–	192 kHz/24 bit	–	192 kHz/24 bit	–	192 kHz/24 bit	–	192 kHz/24 bit

[ ] : 3-D (N-2-2) sound enhancement can function.
• : 2 channel sound

- HDCD sound via the 2CH AUDIO OUT jacks and the 5.1CH SURROUND AUDIO OUT jacks is output in a normal audio CD format when:
  – 3-D (N-2-2) sound enhancement is on.
  – "Analog 6ch" is selected.
- Some of multi-channel recorded DVD audio discs may not be permitted 2-channel mix playback. If you play such a disc on this player connecting two speakers, you may obtain only the original left and right channel sound, and may not hear other channels. This is because of the playback restriction of the disc. Refer to instructions of the disc for details. Such discs may include the same contents recorded in stereo. Play it if available, by changing the audio setting.

Quick control

Simple use of a single button and the cursor control enables you to direct your playback, without manipulating many actual buttons.

- **Using the Graphic Remote Control - V-REMOTE -**
- **Selecting the Playback Function - QUICK -**
- **Accessing Features - NAVI -**

Using the Graphic Remote Control - V-REMOTE -

1
2

Pressing one button can display a graphics based on-screen remote control that allows you to control playback as if you were doing it from the actual remote control.

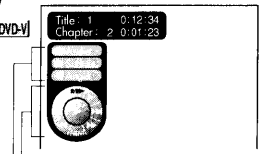
DVD-V VCD CD Using the graphic remote control

1 During playback, press V-REMOTE.

V-REMOTE

The graphic remote control (Virtual Remote) appears.

e.g. DVD-V



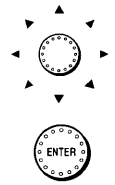
Speed control
Proceed to 2-A.

Stream selection
Proceed to 2-B.

2 Proceed to **A** or **B**.

A: Move the cursor control to select the speed control, and press ENTER.

DVD-V VCD CD



II/II▶ : Pause 27 / Frame by frame 29
▶ : Normal playback 26
I▶ : Slow 30
▶▶I : Forward skip 32
▶▶ : Fast forward 29
◀I : Reverse slow 30
I◀◀ : Reverse skip 32
◀◀ : Fast reverse 29
Navi : Accesses the Navi menu 48

B: Move the cursor control (▲ / ▼) to select "Audio," "Subtitle," or "Angle," and press ENTER.

DVD-V

Audio: Move the cursor control (▲ / ▼) to select a desired audio language, and press **ENTER**.
For details, see page 42.
Selecting the output sound format is not possible here.

Subtitle: Move the cursor control (▲ / ▼) to select a desired subtitle language, and press **ENTER**.
For details, see page 41.

Angle: Move the cursor control (▲ / ▼) to select a desired camera angle, and press **ENTER**.
For details, see page 40.

■ **To turn off the Virtual Remote**

Press **V-REMOTE**.

V-REMOTE

Note

Some discs may not permit this operation.

Selecting the Playback Function - QUICK -

1
2, 3, 4

Pressing one button can display a list of playback functions which are relevant to your current playback mode. You can check and modify them from the list.

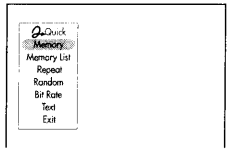
DVD-V DVD-A VCD CD Selecting the playback function

1 During playback, press QUICK.

QUICK

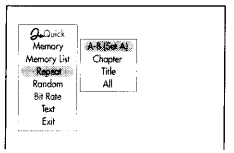
The following on-screen display appears.
(The actual display will vary depending on the playback status.)

e.g. DVD-V



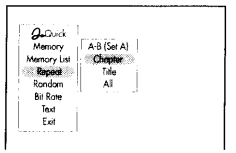
2 Move the cursor control (▲ / ▼) to select a desired item, and press ENTER.

e.g. To change the repeat mode:



3 Move the cursor control (▲ / ▼) to change the setting.

e.g. To select the chapter repeat mode:



4 Press ENTER.

ENTER

The on-screen display disappears and playback will resume according to your selection.

■ **Quick menu**

For details, see the respective pages.

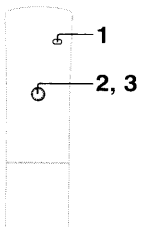
Memory : To program memory playback. 36
Memory List : To list memory settings. 36
Repeat : To select the repeat playback mode. 35
Random : To select the random playback mode. 37
Bitrate : To activate/disable the bitrate display. 48
Text : To activate/disable the Text display.
Text display:
Displays DVD-Text data or CD-Text data if included on the disc.
When playing a DVD audio disc, displays Album Text data if included on the disc. However, Track Text data is not displayed.
(Some content on the disc may not be displayed properly depending on the disc.)
Exit : To quit the on-screen display.

Note

Pressing the QUICK button again also exits the on-screen display.

Accessing Features - NAVI -

The NAVI menu provides an icon based display from which you can easily access key playback function.



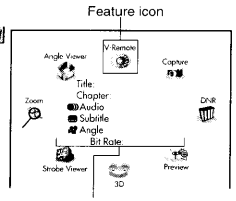
DVD-V DVD-A VCD CD NAVI menu items

1 Press NAVI.

NAVI

The NAVI menu appears.

e.g. DVD-V



Each time you press the NAVI button, the display changes.

Title/Chapter: Elapsed time and remainig time of the current title/chapter.
Audio: Current audio setting
Subtitle: Current subtitle setting
Angle: Current angle setting
Bit Rate: Data transfer rate (Mbit/s)
Amount of picture, sound and subtitle data in the DVD video disc transferred per second.
The larger the value, the more data processed, but this does not necessarily insure better picture quality.

Status display (playback mode, current DNR setting, current zoom status, etc.)

Note

When playing a DVD audio disc, the area may show the sound recording system (sampling frequency and quantization bit) of the disc, and the corresponding speakers using the following symbols.

C (mono):
Recorded in monaural.

L, R:
(L: Left, R: Right)
Recorded in 2ch stereo.

Lf, Rf, C, LFE, S, Ls, Rs:
(Lf: Left front, Rf: Right front, C: Center,
LFE: Subwoofer, S: Surround,
Ls: Left surround, Rs: Right surround)
Recorded in multi-channel.

2 Move the cursor control to select a desired feature icon.

For details on each feature, refer to the list on the next page.

3 Press ENTER.

ENTER

Selection details appears.

4 Refer to the list on the next page and follow the instructions detailed on subsequent pages.

Notes

- The NAVI menu will disappear by pressing the NAVI button several times.
- The number of feature icons on the display will vary depending on the disc.
- Feature icons are displayed only when you play a DVD video disc.

Navi menu selections DVD-V

V-Remote	You can control key playback functions using the graphics based on-screen remote control.	46
Angle Viewer	You can display all camera angles simultaneously and select your preferred one from them.	50
Zoom	You can magnify areas within a picture.	38
Strobe Viewer	You can divide a desired scene into stop action frames for careful analysis.	50
3D	You can enjoy expansive virtual surround sound effects from just two speakers.	51
Preview	You can display thumbnail views of the first scenes of titles or chapters and select a preferred one.	51
DNR	You can view a picture with less video noise.	52
Capture	You can sample a scene from a playback picture and transform it into a background picture.	52

Accessing Features - NAVI - (continued)

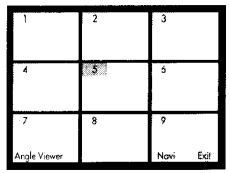
NAVI menu items

Angle Viewer

You can display all camera angles simultaneously and select your preferred one from them.

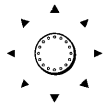
After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



When the scene contains 9 camera angles:

1 Move the cursor control to select.



1-9 : To select the camera angle.
Navi: To return to the NAVI menu.
Exit : To quit the on-screen display.

2 Press **ENTER**.

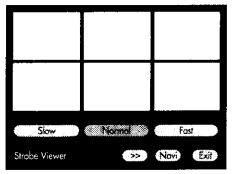
Note
Some discs or scenes may not permit this operation.

Strobe Viewer

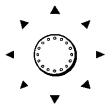
You can divide a desired scene into stop action frames for careful analysis.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.



Slow: Still pictures at shorter intervals.
Normal: Still pictures at normal intervals.
Fast: Still pictures at longer intervals.
>>: To view the next series of 6 pictures.
Navi: To return to the NAVI menu.
Exit : To quit the on-screen display.

2 Press **ENTER**.

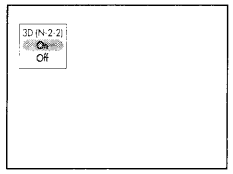
Note
Some discs or scenes may not permit this operation.

3D

You can enjoy expansive virtual surround effects from just two speakers.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.

On: This function works.
Off: This function does not work.

2 Press **ENTER**.

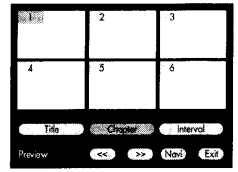
Note
For details and notes on 3-D (N-2-2), see page 39.

Preview

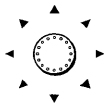
You can display thumbnail views of the first scenes of titles or chapters and select a preferred one.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.



1 - 6: To locate the scene.
Title: To display the first scenes of titles (1 to 6).
Chapter: To display the first scenes of chapters (1 to 6).
Interval: To display scenes at intervals of about 10 minutes apart.
<< : To go to the previous page.
>> : To go to the next page.
Navi: To return to the NAVI menu.
Exit : To quit the on-screen display.

2 Press **ENTER**.

Notes
- Some discs or scenes may not permit this operation.
- Some items may not be selected depending on the disc or scene.
- Some of the first scenes may not picked up depending on the disc.

1-25

Accessing Features - NAVI - (continued)

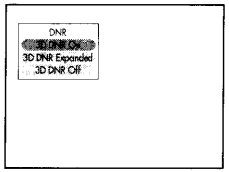
NAVI menu items

DNR

You can view a picture with less video noise.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.

3D DNR On	Normal level.
3D DNR Expanded	Expanded level.
3D DNR Off	Off.

2 Press **ENTER**.

Note

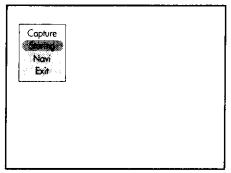
For details and notes on the 3D DNR picture enhancement, see page 39.

Capture

You can sample a scene from a playback picture and transform it into a background picture.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Pause playback at a scene you want to capture.

2 Move the cursor control to select.

Storing:	To sample and store the current picture in the player memory.
Navi:	To return to the NAVI menu.
Exit :	To quit the on-screen display.

3 Press **ENTER**.

The stored picture will be displayed as a background picture when the player is in the stop mode. It is necessary to confirm this process via the setup menu 63.

Notes

- You can store only one picture. Storing a new picture will erase the old one.
- No operations are permitted in process of sampling and storage of background picture.

Function Setup

You can change the default settings to customize performance to your preference.

- **Customizing the Function Settings**
- **Table of Languages**
- **Operating a TV with the remote control**

Customizing the Function Settings

You can change the default settings to customize performance to your preference.

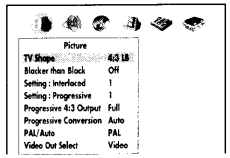
1, 6
2, 3, 4
RETURN

DVD-V DVD-A VCD CD Setting procedure

1 Press SETUP during stop.

SETUP

The following on-screen display appears.



2 Move the cursor control (◄ / ►) to select a symbol for the setting you want to change.

(See the next page.)

◄ ►

- Picture performance settings
- Output sound settings
- Language settings
- Display settings
- Operational settings
- Initial settings

3 Move the cursor control (▲ / ▼) to select the setting you want to change, then press ENTER.

▲ ENTER ▼

4 Change the selection by the cursor control (▲ / ▼) or other buttons, by referring to the corresponding pages [57], then press ENTER.

▲ ENTER ▼

5 Repeat steps 3 and 4 to change other settings.

To select another operation, go back to step 2.

6 Press SETUP.

SETUP

The on-screen display disappears.

■ To return to the previous display

Press **RETURN**.

RETURN

Notes

- The on-screen display disappears when you press the SETUP button.
- The SETUP button can function even during normal playback, however some operations may be inaccessible, and a message will appear. In this case, try again after playback is stopped.

Setting		Details	Page
TV Shape	DVD-V	To select a picture size according to the aspect ratio of your TV.	57
Blacker than Black	DVD-V VCD	To make an adjustment of the black level on your TV using a commercially available test disc that contains adjustment signals.	57
Setting: Interlaced	DVD-V VCD	To adjust the picture quality.	57
Setting: Progressive	DVD-V VCD	To adjust the picture quality. (Only when connected to a PROGRESSIVE TV.)	58
Progressive 4:3 Output	DVD-V VCD	To select the video output of pictures recorded in 4:3 format. (Only when connected to a PROGRESSIVE TV.)	58
Progressive Conversion	DVD-V VCD	To select the system of output signal. (Only when connected to a PROGRESSIVE TV.)	58
PAL/Auto	DVD-V VCD	To select the video system of a disc.	59
Video Out Select	DVD-V VCD	To select the video output type corresponding to your TV system.	59
Audio Out Select	DVD-V DVD-A VCD CD	To select an output sound format corresponding to your system connection.	59
Dynamic Range Control	DVD-V	To turn on or off a function that makes faint sounds easier to hear even if you lower the volume during late hours playback.	61
Karaoke Vocal	DVD-V	To turn on or off the vocal output during DVD KARAOKE disc playback.	61
CD Attenuation	CD	To attenuate sound distortion incurred during playback of an audio CD (HDCD).	61
On-Screen Language	DVD-V DVD-A VCD CD	To select a preferred language for on-screen displays.	61
Disc Menu Language	DVD-V	To select a preferred language for disc menus.	61
Audio Language	DVD-V	To select a preferred language for the sound track.	62
Subtitle Language	DVD-V	To select a preferred language for subtitles.	62

(Continued)

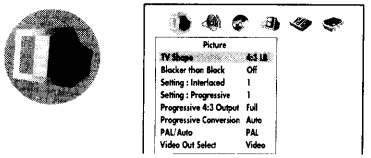
Customizing the Function Settings (continued)

Setting		Details	Page
On-Screen Displays	DVD-V DVD-A VCD CD	To turn on or de-activate the operational status display on the TV screen.	63
Background	DVD-V DVD-A VCD CD	To select the background color or background picture.	63
Screen Saver	DVD-V	To turn the screen saver on or off.	63
Pause/Still	DVD-V	To select the resolution of still pictures. (Field/Frame)	63
Parental Lock	DVD-V	To turn the parental lock function on or off.	63
Remote Confirmation	DVD-V DVD-A VCD CD	To turn on or off the confirmation beeper announcing when each remote command received.	65
Title/Group Stop	DVD-V DVD-A	To turn on or off a feature that automatically stops playback after a title/group has been viewed.	65
PBC	VCD	To use the menu screen when playing a PBC-controllable VIDEO CD.	65
Priority Contents	DVD-V DVD-A	To select the playback priority between DVD video and DVD audio format signals.	65
On-screen Language TV Shape Audio Out Select	DVD-V DVD-A VCD CD	To install the initial system setting.	65

- When using a DVD audio disc that includes pictures, some settings marked DVD-V may be effective.

1-28

Setting details



TV Shape DVD-V

4:3 Letterbox:

Select when a standard 4:3 TV is connected.
Displays theatrical images with masking bars above and below the picture.

4:3 Normal:

Select when a standard 4:3 TV is connected.
Displays pictures cropped to fill your TV screen. Either or both sides of the picture are cut off.

16:9 Widescreen: Select when a 16:9 wide TV is connected.

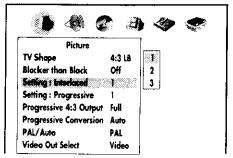
Notes
- The displayable picture size is preset on the DVD video disc. Therefore, the playback picture of some DVD video discs may not conform to the picture size you select.
- When you play DVD video discs recorded in the 4:3 picture size only, the playback picture always appears in the 4:3 picture size regardless of the TV shape setting.
- If you select "16:9 Widescreen" and you own a 4:3 TV set, the DVD playback picture will be horizontally distorted during playback. Images will appear to be horizontally compressed. Always be sure that your TV shape conforms to the actual TV in use.

Blacker than Black DVD-V VCD

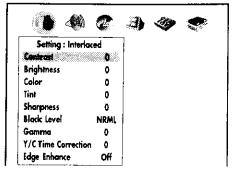
Off: For normal use.
On: Select when you adjust the black level of your TV using a commercially available test disc that contains adjustment signals.

Setting : Interlaced DVD-V VCD

You can fine adjust picture quality and store up to 3 custom picture settings in the memory of the DVD player.
To select a preset memory setting:
1) Move the cursor control (▲ / ▼) to select a memory number (1 to 3), and press the ENTER button.



2) Move the cursor control (▲ / ▼) to select the element, and press the ENTER button.



3) Move the cursor control (◄ / ►) to adjust the value, and press the ENTER button.

(-7) Lower	Contrast	Higher (+7)
(-7) Darker	Brightness	Brighter (+7)
(-7) Duller	Color	Brighter (+7)
(-7) Redder	Tint*1	Greener (+7)
(-7) Softer	Sharpness	Sharper (+7)
Normal	Black Level*2	Light
(–)	Gamma*3	(+)
(-3)	Y/C Time Correction*4	(+3)
Off	Edge Enhance*5	On

*1: The Tint adjustment is not available when connecting to a TV via the component video jacks (Y, P_B, P_R).
*2: This option is applicable to NTSC TVs only, and has no effect on PAL TVs, though it can be selected on the screen.
*3: Adjust when playback pictures are too dark or too whitish.
*4: Adjust horizontal color deviations. Pictures may shift horizontally during the adjustment.
*5: To enhance picture edges.

(Continued)

Customizing the Function Settings (continued)

Setting details

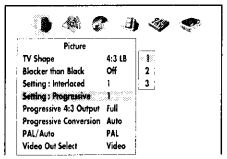
(Continued)

Note
These adjustments are not available when connecting to a PROGRESSIVE TV.

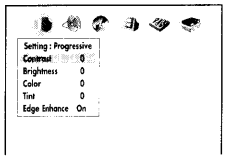
Setting : Progressive DVD-V VCD

You can fine adjust picture quality and store up to 3 picture settings in the memory of the DVD player. (Only when connected to a PROGRESSIVE TV.)
To select a preset memory setting:

1) Move the cursor control (▲ / ▼) to select a memory number (1 to 3), and press the ENTER button.



2) Move the cursor control (▲ / ▼) to select the element, and press the ENTER button.



3) Move the cursor control (◄ / ►) to adjust the value, and press the ENTER button.

(-7) Lower	Contrast	Higher (+7)
(0) Darker	Brightness	Brighter (+14)
(-7) Duller	Color	Brighter (+7)
(-7) Redder	Tint	Greener (+7)

Edge Enhance*1
To enhance picture edges.
(Off < On < Expanded1 < Expanded2)

*1: Depending on the connected equipment, there may be undesirable effects on pictures. In this case, select "Off".

Progressive 4:3 Output DVD-V VCD

Select the video output of pictures recorded in 4:3 format. (Only when connected to a PROGRESSIVE TV.)

Full: Displays pictures expanded horizontally to fill the 16:9 screen.

4:3: Displays images in 4:3 aspect ratio with masking bars to the left and right of the picture.

Progressive Conversion DVD-V VCD

There are two types of source content in pictures recorded in DVD video discs: film content (pictures recorded from films at 24 frames per second) and video content (video signals recorded at 30 frames per second). Make this selection according to the type of content being viewed.

Auto: Select this position normally.
The DVD player automatically detects source content, film or video, of playback source, and converts that signal in the progressive output format in an appropriate method.

Video: The DVD player filters video signal, and converts it in the progressive output format appropriately.
Suitable for playback of video content pictures.

Film: The DVD player converts film content pictures in the progressive output format appropriately.
Suitable for playback of film content pictures.
The progressive output feature will be most effective under this selection.

Note
Depending on the disc, pictures may be cut off or doubled. In this case, select "Video."

PAL/Auto DVD-V VCD

PAL: To play a PAL disc. Connect a PAL TV to view a picture.

Auto: The DVD player automatically identifies PAL or NTSC video system of a disc. Connect a multisystem TV (PAL/NTSC compatible) to view a picture.
A playback picture may be distorted when detected a signal change between PAL and NTSC on the disc.

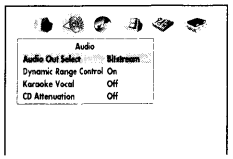
Video Out Select DVD-V VCD

Video: Select when connected to a normal TV. 18

S Video: Select when connected to a TV compatible with S video signals. 18 20

RGB: Select when connected to an RGB monitor. 18

Notes
- When you connect a TV equipped with the component video inputs or a PROGRESSIVE TV (525P (480P)), select "Video" or "S Video". 19
- If the on-screen display disappears immediately after you select "RGB", you can restore it by connecting the DVD player using the VIDEO OUT (yellow) jack.



Audio Out Select DVD-V DVD-A VCD CD

Select the output sound format corresponding to your system connection.
For details of sound recording systems, see 43.

Bitstream: Select when connected to an amplifier equipped with a Dolby Digital, DTS, MPEG1 or MPEG2 decoder. 22 23
The DVD player outputs digital audio information in the bitstream format when you play a DVD video disc recorded on the Dolby Digital, DTS, MPEG1 or MPEG2 recording system.

Analog 6ch: Select when connected to an AV amplifier equipped with 5.1ch audio inputs. 24
The next screen will detail the appropriate settings.

Analog 2ch: Select when connected to a TV, or Dolby Pro Logic or stereo system via the analog audio jacks. 18 19 20 22

PCM: Select when connected to a 2 channel digital stereo amplifier. 24
The DVD player outputs sounds in the PCM 2ch format when you play a DVD video disc recorded on the Dolby Digital, MPEG1 or MPEG2 recording system.

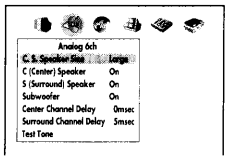
(Continued)

Customizing the Function Settings (continued)

Setting details

(Continued)

When you select "Analog 6ch":
Make the following settings for the built-in 5.1ch surround decoder.



1) Select an item by moving the cursor control (▲ / ▼), and press the ENTER button.

2) Make the settings (see below) by moving the cursor control (▲ / ▼ / ◄ / ►), and press the ENTER button.

C.S.Speaker Size
Small: When the center speaker or surround speakers cannot reproduce low frequency signals below 120 Hz.
Large: When the center speaker and surround speakers can reproduce low frequency signals below 120 Hz.

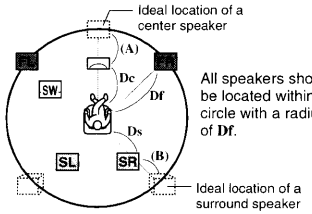
C(Center) Speaker
Off: When center speaker is not connected.
On: When you connect center speaker.

S(Surround) Speaker
Off: When surround speakers are not connected.
On: When you connect surround speakers.

Subwoofer
Off: When a sub woofer is not connected.
On: When you connect a sub woofer.

Note
Depending on the sound in a DVD audio disc, speakers may output each sound of recorded channels, regardless of your settings.

Adjusting the delay time:
When enjoying 5.1ch surround playback, it is ideal to choose a listening position that is the same distance from each speaker. By adjusting the delay time of the center/surround speakers, you can virtually create an ideal listening environment (as if the center/surround speakers were at their ideal locations respectively as below.)



All speakers should be located within a circle with a radius of **Df**.

Center Channel Delay
0msec: When **Df** equals **Dc**.
1msec: When (**A**) is approx. 34 cm (13 inch)
2msec: When (**A**) is approx. 68 cm (27 inch)
3msec: When (**A**) is approx. 102 cm (40 inch) . . .
*(**A**) = **Df** – **Dc**
Get your optimum value (0, 1, 2 . . . 5) dividing (**A**) by 34.

Surround Channel Delay
0msec: When **Df** equals **Ds**.
1msec: When (**B**) is approx. 34 cm (13 inch)
2msec: When (**B**) is approx. 68 cm (27 inch)
3msec: When (**B**) is approx. 102 cm (40 inch) . . .
*(**B**) = **Df** – **Ds**
Get your optimum value (0, 1, 2 . . . 15) dividing (**B**) by 34.

Note
Depending on the sound in a DVD audio disc, the DVD player may adjust delay time as "0msec," regardless of your delay time settings.

3) Select "Test Tone" and press the ENTER button.
The DVD player outputs a test signal to each speaker when it is in stop mode. When playing a DVD video disc, it substitutes the current sound for the test signal.
Move the cursor control (◄ / ►) to select the receiving speakers, and adjust the volume of each speaker at the same level by moving the cursor control (▲ / ▼).
If all the volume levels cannot be equalized, adjust them on the amplifier.

Note
Depending on the disc, 6 channel sounds may not be output via the 5.1CH SURROUND AUDIO OUT jacks.

Dynamic Range Control DVD-V

Off: Full dynamic range is maintained.
On: Dynamic range is reduced.

Notes
- This function works only during playback of Dolby Digital recorded discs.
- The level of Dynamic Range Reduction may differ depending on the DVD disc.

Karaoke Vocal DVD-V

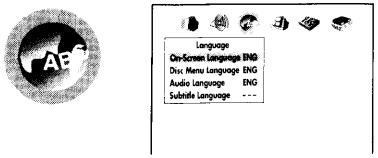
Off: The primary vocal is not output.
On: The primary vocal is output when it is recorded on the disc.

Notes
- The vocal output feature is used during playback of Dolby Digital (multi-channel) recorded DVD KARAOKE discs. This feature allows you to turn off vocal audio tracks, or restore them for background accompaniment.
- When playing KARAOKE, connect appropriate audio equipment such as an amplifier to the DVD player.

CD Attenuation CD

HDCD enhances the output sound level of audio CD by approximately 6 dB. As such, distortion may occur in some connected products that are unable to compensate for a wide range of input signal levels. (e.g. TV, stereo receivers)

Off: For normal use.
On: Select when an HDCD sound is distorted. Sound volume of an HDCD is lessened.



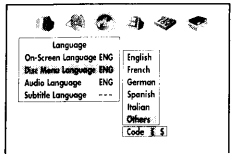
On-Screen Language DVD-V DVD-A VCD CD

English: To view on-screen displays in English.
Français: To view on-screen displays in French.
Deutsch: To view on-screen displays in German.
Español: To view on-screen displays in Spanish.
Italiano: To view on-screen displays in Italian.

Disc Menu Language DVD-V

English: To display disc menus in English.
French: To display disc menus in French.
German: To display disc menus in German.
Spanish: To display disc menus in Spanish.
Italian: To display disc menus in Italian.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 66.
2) Select the first character by moving the cursor control (▲ / ▼).
3) Move the cursor control (◄ / ►) to shift and select the second character by moving the cursor control (▲ / ▼).



4) Press the ENTER button.

Note
Some DVD video discs may not include your pre-selected language. In this case, the DVD player automatically displays disc menus consistent with the disc's initial language setting.

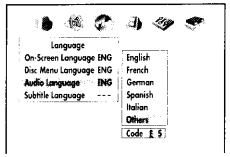
Customizing the Function Settings (continued)

Setting details

Audio Language DVD-V

English: To play sound tracks in English.
French: To play sound tracks in French.
German: To play sound tracks in German.
Spanish: To play sound tracks in Spanish.
Italian: To play sound tracks in Italian.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 66.
2) Select the first character by moving the cursor control (▲ / ▼).
3) Move the cursor control (◄ / ►) to shift and select the second character by moving the cursor control (▲ / ▼).



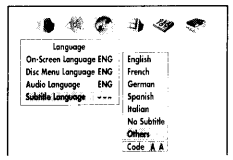
4) Press the ENTER button.

Note
Some DVD video discs may be played in a different language than you selected. A prior language may be programmed on the disc.

Subtitle Language DVD-V

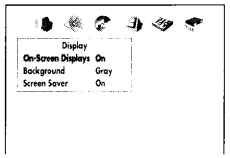
English: To display subtitles in English.
French: To display subtitles in French.
German: To display subtitles in German.
Spanish: To display subtitles in Spanish.
Italian: To display subtitles in Italian.
No Subtitle: To disable subtitles.
Others: To make a further choice.
After pressing the ENTER button, follow steps 1) - 4) below.

1) Obtain the abbreviation of the preferred language from the list 66.
2) Select the first character by moving the cursor control (▲ / ▼).
3) Move the cursor control (◄ / ►) to shift and select the second character by moving the cursor control (▲ / ▼).



4) Press the ENTER button.

Notes
- Some DVD video discs may be set to display subtitles in a different language than you selected. A prior subtitle language may be programmed on the disc.
- Some DVD video discs allow you to change subtitle selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate subtitle language from the selection on the disc menu.



On-Screen Displays DVD-V DVD-A VCD CD

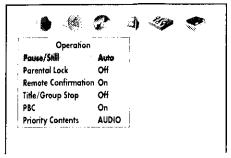
Off: Operational modes (e.g. "Play", " ") are not displayed.
On: Operational modes (e.g. "Play", " ") are displayed on-screen.

Background DVD-V DVD-A VCD CD

Blue: Blue background.
Gray: Gray background.
Capture: To use a picture you sampled and stored in the memory using the Capture feature 52 as a background.
Jacket: To use the jacket picture included on some discs as a background. If it is not included, a gray background will be substituted.

Screen Saver DVD-V

Off: The screen saver is disengaged.
On: The screen saver operates.



Pause/Still DVD-V

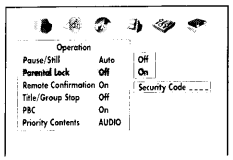
Auto: For normal use. Still and fast motion images can be paused.
Frame: The resolution of still pictures is improved, so that you can make a motionless picture more clearer when you pause it.

Parental Lock DVD-V

DVD video discs equipped with the parental lock function are rated according to their content. The contents allowed by a parental lock level and the way a DVD video disc can be controlled may vary from disc to disc. For example, if the disc allowed you could edit out violent scenes unsuitable for children and replace them with more suitable scenes, or lock out playback of the disc altogether.

- DVD video discs may or may not respond to the parental lock settings. This is not a defect in the DVD player. Make sure this function works with your DVD video discs.

Off: The parental lock feature does not function.
After pressing the ENTER button, follow step 1) below.
On: To activate the parental lock feature or change the settings.
After pressing the ENTER button, follow steps 1) - 3) below.



(Continued)

Customizing the Function Settings (continued)

Setting details

(Continued)

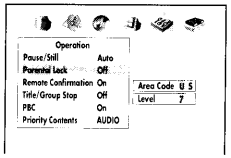
1) Press the number buttons to create a personal 4-digit security code, then press the ENTER button.
If you make a mistake before pressing the ENTER button, press the CLEAR button and enter your 4-digit security code again.

2) Enter the code of a country/area whose standards were used to rate the DVD video disc, referring to the list below.

Country/area	Code
AUSTRALIA	AU
BELGIUM	BE
CANADA	CA
CHINA	CN
CHINA HONG KONG	HK
DENMARK	DK
FINLAND	FI
FRANCE	FR
GERMANY	DE
INDONESIA	ID
ITALY	IT
JAPAN	JP
MALAYSIA	MY
NETHERLANDS	NL
NORWAY	NO
PHILIPPINES	PH
RUSSIAN FEDERATION	RU
SINGAPORE	SG
SPAIN	ES
SWEDEN	SE
SWITZERLAND	CH
TAIWAN	TW
THAILAND	TH
UNITED KINGDOM	GB
UNITED STATES	US

a) Select the first character by moving the cursor control (▲ / ▼).
b) Move the cursor control (◄ / ►) to shift and select the second character by moving the cursor control (▲ / ▼).
c) Press the ENTER button.

3) Move the cursor control (▲ / ▼) to select the parental lock level, then press the ENTER button.



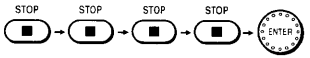
You cannot play DVD video discs rated higher than the level you selected unless you cancel the parental lock function.
For example, when you select level 7, discs rated higher than level 7 are locked out and cannot be played.

The parental lock level is equivalent to the following USA movie ratings.
Level 7: NC-17
Level 6: R
Level 4: PG 13
Level 3: PG
Level 1: G

The parental lock levels for other countries/areas than U.S. are included for future use. Check the appropriate parental lock level when you buy a DVD video disc equipped with the parental lock feature in the future.

■ **To change the parental lock level**
Follow steps 1) - 3).

■ **To change your 4-digit security code**
1) After selecting "On" or "Off," press the STOP button four times, then press the ENTER button.



The 4-digit security code is cleared.
2) Press the number buttons to create a new 4-digit security code.
3) Press the ENTER button.

Remote Confirmation DVD-V DVD-A VCD CD

Off: The beeper does not sound.
On: The beeper sounds with each remote operation.

Title/Group Stop DVD-V DVD-A

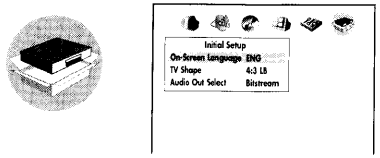
Off: The DVD player continues after playback of a title/group is completed.
On: The DVD player stops after playback of a title/group is completed.

PBC VCD

Off: When playing a VIDEO CD without using the menu.
On: To use the menu when playing a PBC-featured VIDEO CD.

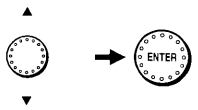
Priority Contents DVD-V DVD-A

Select the playback priority between DVD video and DVD audio format signals when playing a DVD disc that contains both DVD video and DVD audio format signals.
DVD-AUDIO: DVD audio format signals take priority over DVD video format signals.
DVD-VIDEO: DVD video format signals take priority over DVD audio format signals.



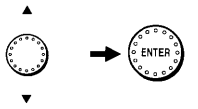
Initial Setup DVD-V DVD-A VCD CD

1) Move the cursor control (▲ / ▼) to select "On-Screen Language," and press the **ENTER** button.



2) Select a language moving the cursor control (▲ / ▼), and press the **ENTER** button.

See page 61, "On-screen Language."



3) Make your selection in the same manner as step 1) then step 2).

See page 57, "TV Shape."
See page 59, "Audio Out Select."

Table of Languages

Table of languages and their abbreviations

Abbreviation	Language
– – –	No alternate language
CHI (ZH)	Chinese
DUT (NL)	Dutch
ENG (EN)	English
FRE (FR)	French
GER (DE)	German
ITA (IT)	Italian
JPN (JA)	Japanese
KOR (KO)	Korean
MAY (MS)	Malay
SPA (ES)	Spanish
AA	Afar
AB	Abkhazian
AF	Afrikaans
AM	Amharic
AR	Arabic
AS	Assamese
AY	Aymara
AZ	Azerbaijani
BA	Bashkir
BE	Belorussian
BG	Bulgarian
BH	Bihari
BI	Bislama
BN	Bengali, Bangla
BO	Tibetan
BR	Breton
CA	Catalan
CO	Corsican
CS	Czech
CY	Welsh
DA	Danish
DZ	Bhutani
EL	Greek
EO	Esperanto
ET	Estonian
EU	Basque
FA	Persian
FI	Finnish
FJ	Fiji
FO	Faroese
FY	Frisian
GA	Irish
GD	Scottish Gaelic
GL	Galician

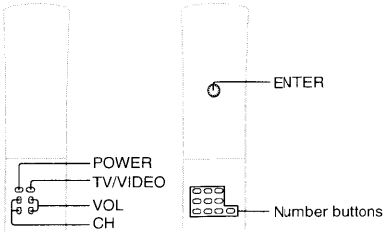
Abbreviation	Language
GN	Guarani
GU	Gujarati
HA	Hausa
HI	Hindi
HR	Croatian
HU	Hungarian
HY	Armenian
IA	Interlingua
IE	Interlingue
IK	Inupiak
IN	Indonesian
IS	Icelandic
IW	Hebrew
JI	Yiddish
JW	Javanese
KA	Georgian
KK	Kazakh
KL	Greenlandic
KM	Cambodian
KN	Kannada
KS	Kashmiri
KU	Kurdish
KY	Kirghiz
LA	Latin
LN	Lingala
LO	Laotian
LT	Lithuanian
LV	Latvian, Lettish
MG	Malagasy
MI	Maori
MK	Macedonian
ML	Malayalam
MN	Mongolian
MO	Moldavian
MR	Marathi
MT	Maltese
MY	Burmese
NA	Nauru
NE	Nepali
NO	Norwegian
OC	Occitan
OM	(Afan) Oromo
OR	Oriya
PA	Panjabi
PL	Polish
PS	Pashto, Pushto

Abbreviation	Language
PT	Portuguese
QU	Quechua
RM	Rhaeto-Romance
RN	Kirundi
RO	Rumanian
RU	Russian
RW	Kinyarwanda
SA	Sanskrit
SD	Sindhi
SG	Sango
SH	Serbo-Croatian
SI	Singhalese
SK	Slovak
SL	Slovenian
SM	Samoan
SN	Shona
SO	Somali
SQ	Albanian
SR	Serbian
SS	Siswati
ST	Sesotho
SU	Sundanese
SV	Swedish
SW	Swahili
TA	Tamil
TE	Telugu
TG	Tajik
TH	Thai
TI	Tigrinya
TK	Turkmen
TL	Tagalog
TN	Setswana
TO	Tongan
TR	Turkish
TS	Tsonga
TT	Tatar
TW	Twi
UK	Ukrainian
UR	Urdu
UZ	Uzbek
VI	Vietnamese
VO	Volapük
WO	Wolof
XH	Xhosa
YO	Yoruba
ZU	Zulu

1-33

Operating a TV with the remote control

You can operate the basic functions of selected TVs using the supplied remote control.



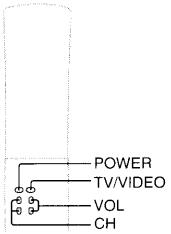
Operating a TV with the remote control

Preparation

Follow the instruction of "To program the remote control" to set the brand code.

Point the remote control at your TV, and use buttons as follows.

POWER	To turn the power on and off.
TV/VIDEO	To select a video input.
VOL ▲/▼	To adjust the volume.
CH ▲/▼	To select a channel.

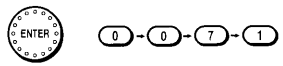


Close the cover to use these buttons.

■ To program the remote control

1 While holding down **ENTER**, press the **number buttons** that correspond to your TV's brand code referring to the list on the next page.

e.g. To Program brand code 0071.



Hold down.

2 Release **ENTER**.
The DVD remote control memorizes the selected brand code.

Notes

- The remote control is programmed at the factory to operate TOSHIBA TVs.
- A single brand may use different codes depending on the particular model. Enter the correct number referring to the brand code table.
- For some brands, several brand codes are provided. Try each of them until the remote control operates your TV.
- Some TVs may not respond to all of the functions in the table above, or may not be operated at all with this remote control. In this case, operate that TV with its own remote control.
- If you replace the remote control's batteries, remember to reprogram the brand codes for TV.

■ Brand code table

Brand name	Brand code				
TOSHIBA	0001	0071	0211	0571	
AIWA	0921				
AKAI	0201	0241	0331	0431	0501
	0521	0641			
BAIRD	0171	0241			
BANG & OLUFSEN	0471				
BEKO	0181				
BLAUPUNKT	0071	0321	0331		
BRIONVEGA	0461	0471	0651		
BUSH	0071	0501	0551	0571	
CROWN	0111	0131	0411	0491	0501
	0661				
DEAWOO	0401	0411	0501		
DANSAI	0501				
DECCA	0091	0141	0171	0441	0451
	0501				
FERGUSON	0031	0071	0131	0191	0291
	0311	0381	0541	0601	
FINLUX	0021	0041	0071	0081	0091
	0111	0271	0281	0291	0301
	0341	0471			
FISHER	0041	0121	0181	0201	0281
	0471	0571	0651		
FUNAI	0001	0191	0481	0491	
GEC	0171	0221			
GOLDSTAR	0201	0251	0281	0411	0501
GOODMANS	0171	0281	0501	0571	
GRANADA	0171	0241	0271	0501	0571
	0651	0671			
GRUNDIG	0011	0071	0271	0321	0331
HINARI	0241	0411	0571	0631	
HITACHI	0021	0221	0251	0351	0371
	0381	0431	0571	0641	0751
INNO HIT	0171	0281	0411	0501	0631
	0661				
ITT	0231	0241	0261	0271	0401
	0611				
ITT-NOKIA	0231	0241	0261	0271	0401
	0611				
JVC	0311	0431	0521	0571	
LOEWE OPTA	0471	0501	0571	0651	
LUXOR	0241	0261	0271	0281	0351
MAGNAVOX	0501	0071	0191	0221	0461
	0471	0591	0611	0651	
MARANTZ	0201	0501			
MATSUI	0001	0171	0191	0231	0411
	0441	0451	0501	0551	0571
METZ	0041	0331	0361	0461	0471
	0651				
MITSUBISHI	0201	0321	0331	0451	0501
	0511	0571	0651	0771	
NATIONAL	0501	0371	0511	0531	0761
	0841	0911			
NEC	0201	0251	0571	0741	
NOKIA	0231	0241	0261	0271	0401
	0611				
NORDMENDE	0281	0351	0381	0421	0431
	0461	0521	0541	0641	0671

Brand name	Brand code				
OCEANIC	0481				
ORION	0001	0191	0231	0361	0411
	0441	0451	0501	0551	0611
PANASONIC	0371	0501	0511	0531	0761
	0841	0911	1061		
PHILCO	0071	0111	0181	0201	0271
	0301	0461	0501	0651	
PHILIPS	0071	0191	0221	0461	0471
	0501	0591	0611	0651	
PIONEER	0381	0431	0501	0831	1051
PROSCAN - THOMSON	0971	1041	0201	0501	
RCA	0971	1071	1081	1091	0201
	1041	0501			
REALISTIC	0631	1001	1011	1021	1031
	0851	0201	0501	0481	0321
	0331				
SABA	0281	0351	0381	0421	0431
	0471	0541	0641	0651	0661
	0671				
SAISHO	0231	0411	0441	0451	0551
SALORA	0231	0241	0351		
SAMSUNG	0171	0181	0251	0281	0411
	0491	0501	0631	0661	0791
SANYO	0021	0041	0081	0121	0171
	0181	0201	0231	0241	0451
	0571	0651			
SCHNEIDER	0011	0051	0061	0281	0461
	0501	0581	0591		
SEG	0091	0121	0151		
SELECO	0031	0051	0061	0351	0501
	0561				
SHARP	0851	0511	0571	0201	0501
SIEMENS	0071	0321	0331	0571	0631
SINGER	0091	0471	0651		
SINUDYNE	0001	0091	0101	0131	0191
	0231	0361	0471	0501	0551
	0581	0651			
SONY	0441	0451	0571	0681	
TANDBERG	0041	0301	0351	0431	0461
	0571	0651			
TATUNG	0091	0141	0171	0441	0451
	0501				
TECHNICS	0371	0501	0511	0531	0761
	0841	0911			
TELEFUNKEN	0071	0281	0381	0421	0431
	0521	0601	0621	0671	
TENSAI	0041				
THOMSON	0281	0351	0371	0381	0391
	0421	0431	0521	0541	0641
	0971	1041			
THORN	0041	0071	0281	0291	0341
	0421	0491	0601	0671	
UNIVERSUM	0021	0491			
YAMAHA	0201	0501	0321	0331	0451
	0511	0571	0651	0771	
ZANUSSI	0031	0051	0061	0351	0501
	0561				
ZENITH	0931				

Others

- **Before Calling Service Personnel**
- **Specifications**

Before Calling Service Personnel

Check the following guide for the possible cause of a problem before contacting service.

Symptoms and correction

Symptom	Cause	Correction	Page
No power.	• The power plug is disconnected.	• Connect the power plug securely into the wall outlet.	18
The DVD player turned off by itself.	• The automatic power off function turned the unit off.	• Press the PLAY button.	27
No picture.	• The TV is not set to receive DVD signal output.	• Select the appropriate video input mode on the TV so the picture from the DVD player appears on the TV screen.	26
	• The video cable is not connected securely.	• Connect the video cable securely into the appropriate jacks.	18-20
No sound.	• The equipment connected with the audio cable is not set to receive DVD signal output.	• Select the correct input mode of the audio receiver so you can listen to the sound from the DVD player.	26
	• The audio cable is not connected securely.	• Connect the audio cable securely into the appropriate jacks.	18-24
	• The audio receiver or TV is turned off.	• Turn on the equipment connected with the audio cable.	26
	• The setting of output sound format is incorrect.	• Select the proper audio setting.	42, 54 59
The playback picture has occasional distortion.	• The disc is dirty.	• Eject the disc and clean it.	9
	• It is in fast forward or fast reverse playback.	• Sometimes a small amount of picture distortion may appear. This is not a malfunction.	–
Brightness is unstable or noises are present in the playback pictures.	• The effect of copy protection.	• Connect the DVD player directly to the TV. Avoid connecting the DVD player to a VTR or TV/VTR combination.	18
The DVD player does not start playback.	• No disc is inserted.	• Insert a disc.	26
	• An unplayable disc is inserted.	• Insert a playable disc. (Check the disc type and color system.)	10
	• The disc is placed upside down.	• Place the disc with the playback side down.	26
	• The disc is not placed within the guide.	• Place the disc correctly inside the guide on the disc tray.	26
	• The disc is dirty.	• Clean the disc.	9
	• The parental lock function is set.	• Cancel the parental lock function or change the parental lock level.	54, 63
Playback does not follow the course of the disc's program.	• It is in the mode of repeat playback, memory playback, etc.	• These operations may prevent a proper progress of the contents.	–
Buttons do not work.	• Power supply fluctuations or other abnormalities such as static electricity may interrupt correct operations.	• Turn the power on or off with the ON/STANDBY button. Or disconnect the power plug and insert it into the wall outlet again.	–
The remote control does not work properly.	• The remote control is not pointed at the remote sensor of the DVD player.	• Point the remote control at the remote sensor of the DVD player.	15
	• The remote control is too far from the DVD player.	• Operate the remote control within about 7 m.	15
	• The batteries in the remote control are exhausted.	• Replace the batteries with new ones.	15

2. LOCATION OF MAIN PARTS AND MECHANISM PARTS

2-1. Location of Main Parts

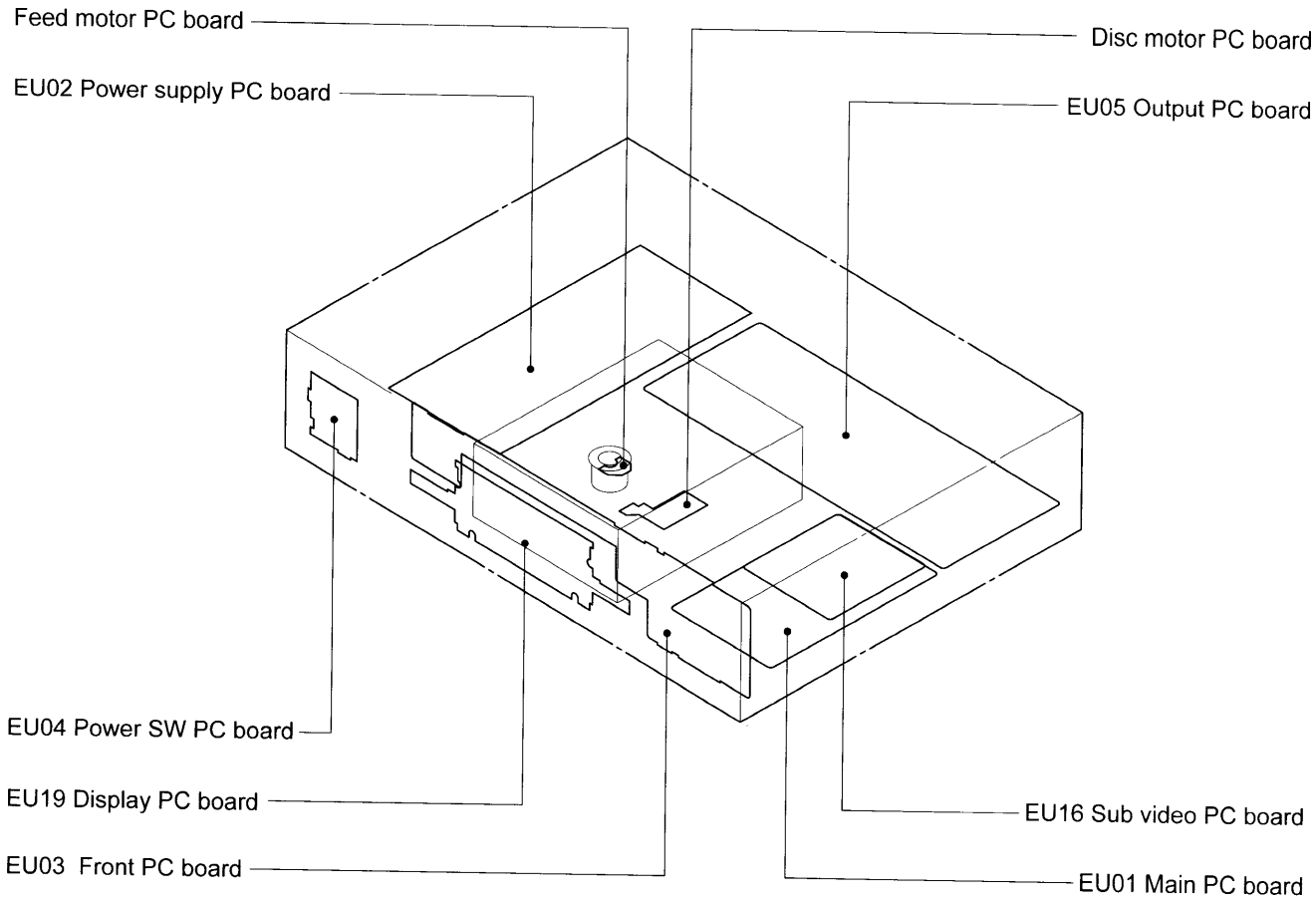

Feed motor PC board
EU02 Power supply PC board
Disc motor PC board
EU05 Output PC board
EU04 Power SW PC board
EU19 Display PC board
EU03 Front PC board
EU16 Sub video PC board
EU01 Main PC board

Fig. 1-2-1

2-2. Location of Mechanism Parts

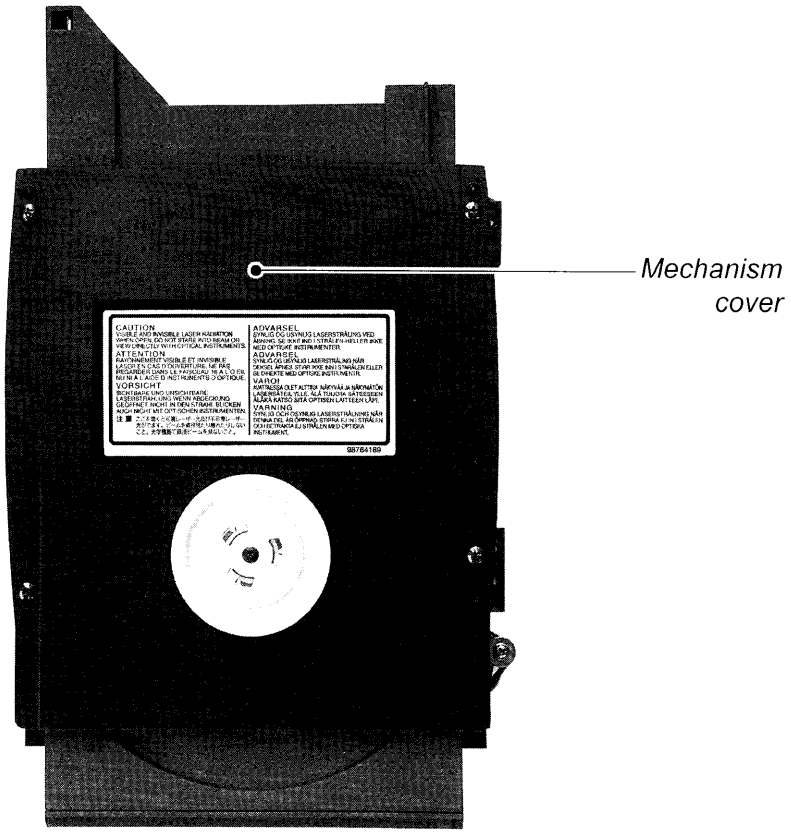


Fig. 1-2-2 Mechanism chassis assembly (Top side)

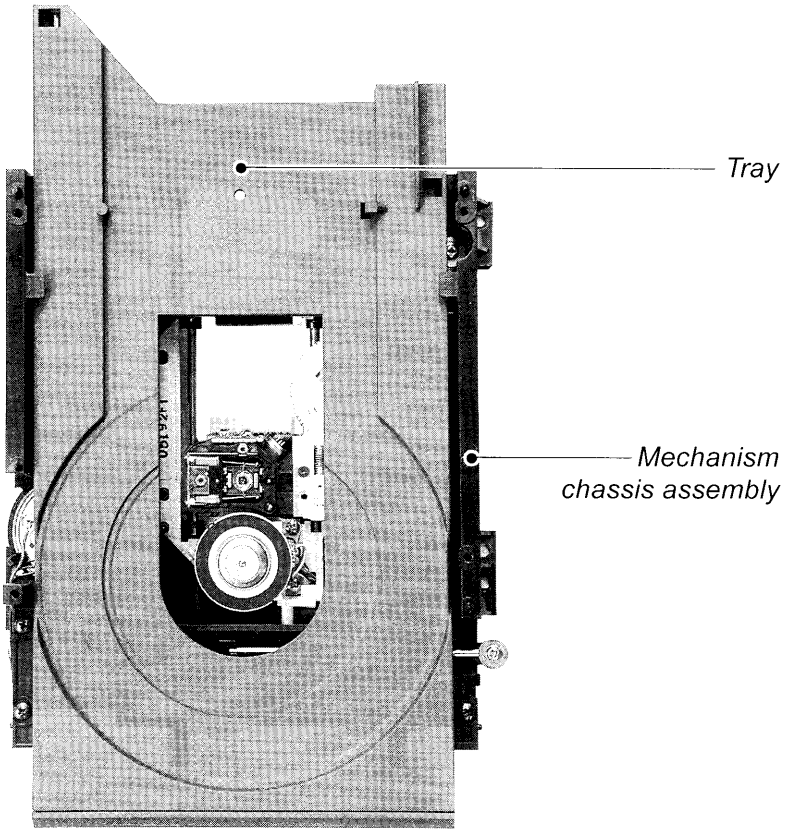


Fig. 1-2-3 Mechanism chassis assembly (Bottom side)

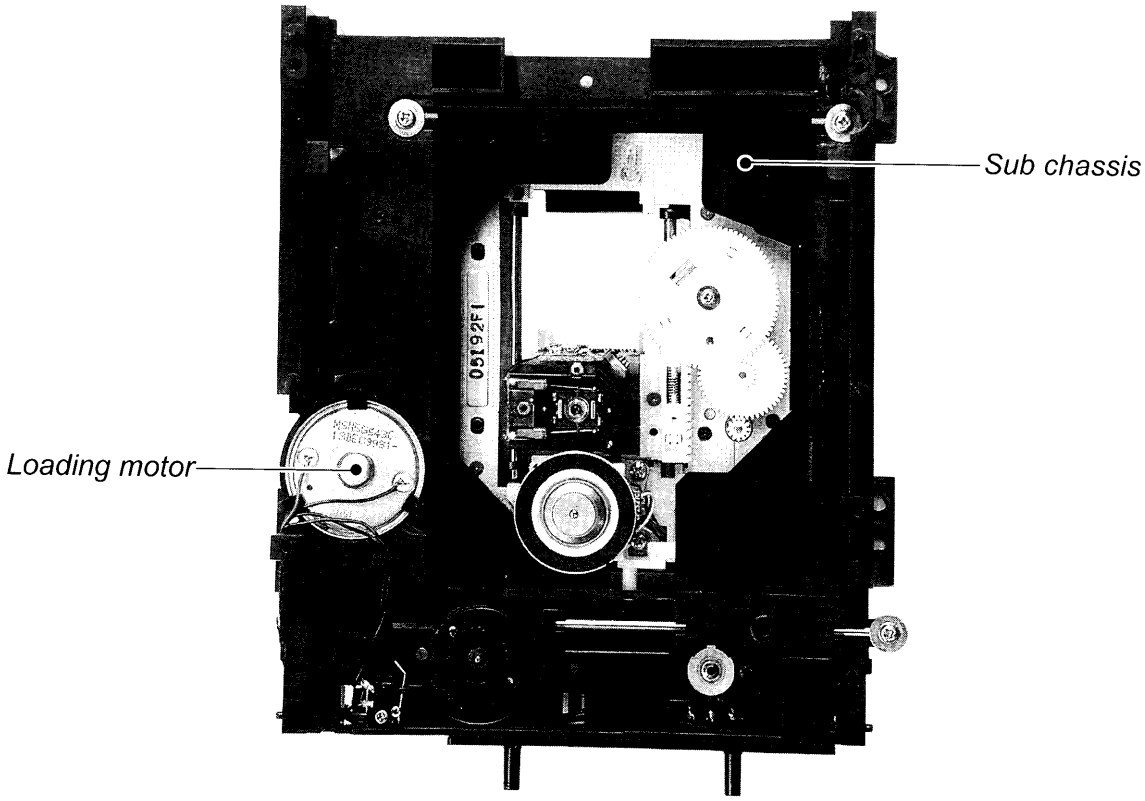


Fig. 1-2-4 Mechanism chassis assembly (Internal side)

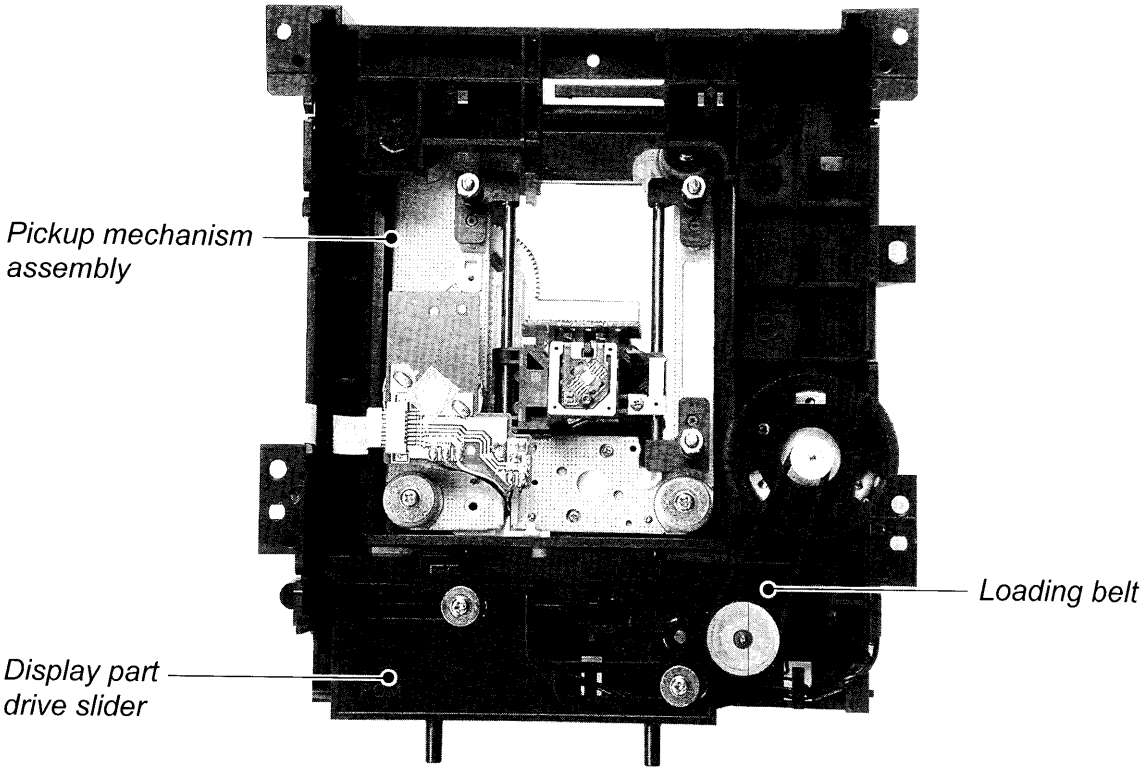


Fig. 1-2-5 Mechanism chassis assembly (Bottom side)

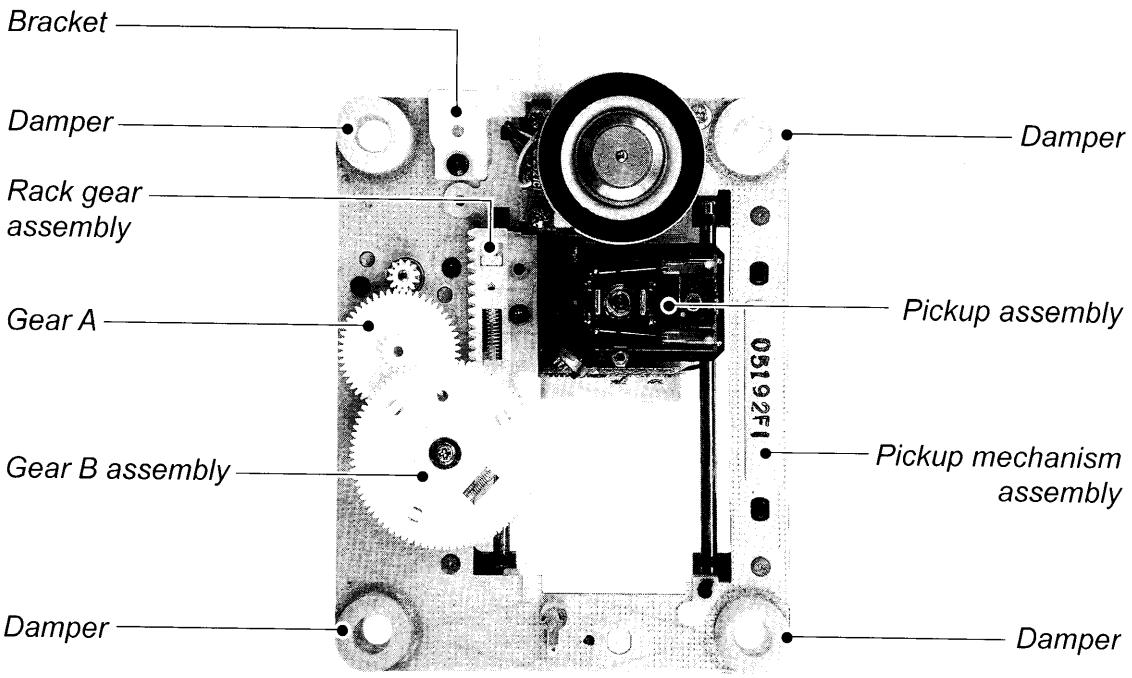


Fig. 1-2-6 Pickup mechanism chassis assembly (Top side)

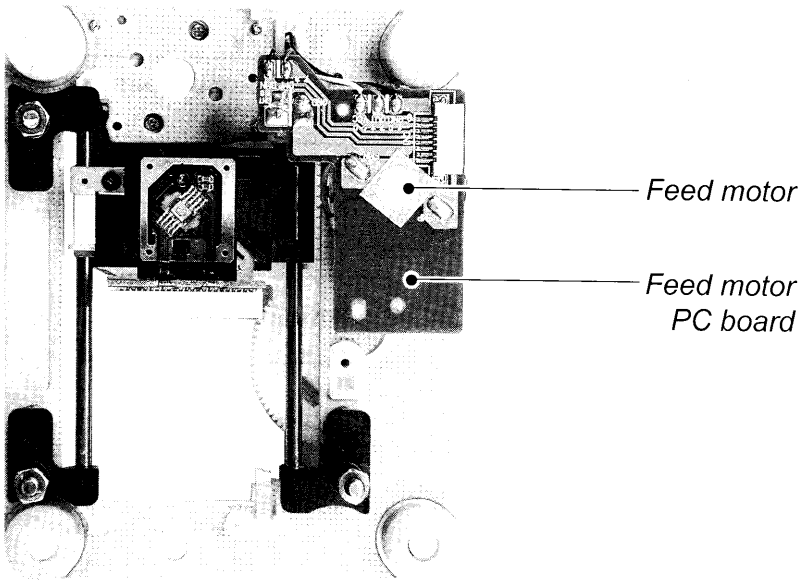


Fig. 1-2-7 Pickup mechanism chassis assembly (Bottom side)

3. TROUBLESHOOTING

3-1. Main Circuit

3-1-1. Servo System

(1) Initial Operation after Power ON

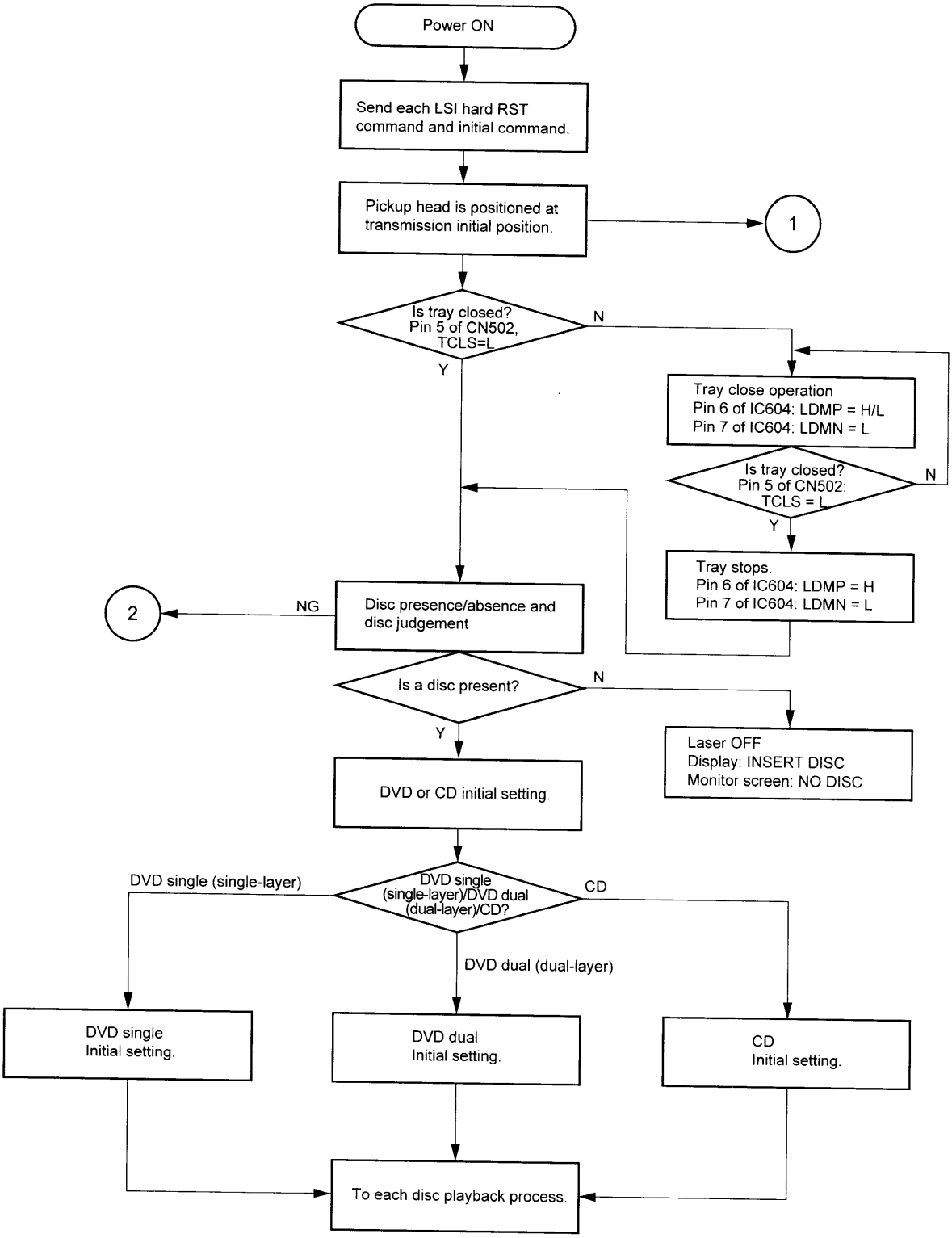


Fig. 1-3-1

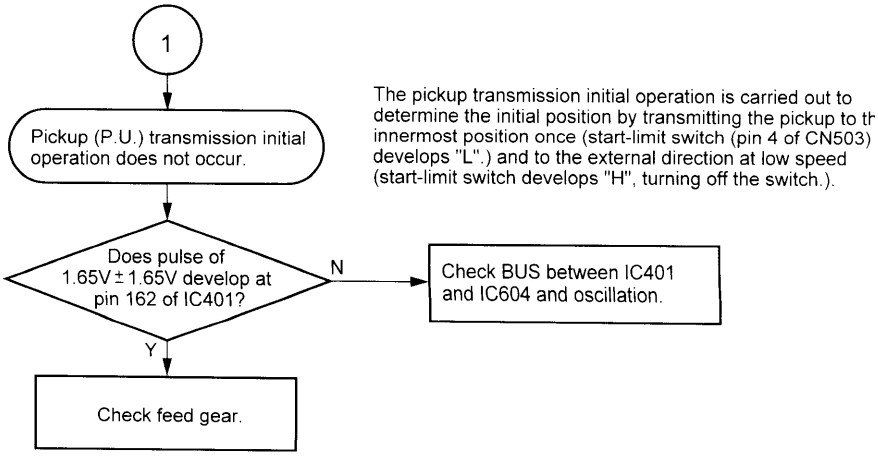

1
Pickup (P.U.) transmission initial operation does not occur.
The pickup transmission initial operation is carried out to determine the initial position by transmitting the pickup to th innermost position once (start-limit switch (pin 4 of CN503) develops "L".) and to the external direction at low speed (start-limit switch develops "H", turning off the switch.).
Does pulse of 1.65V ± 1.65V develop at pin 162 of IC401?
N
Check BUS between IC401 and IC604 and oscillation.
Y
Check feed gear.

Fig. 1-3-2

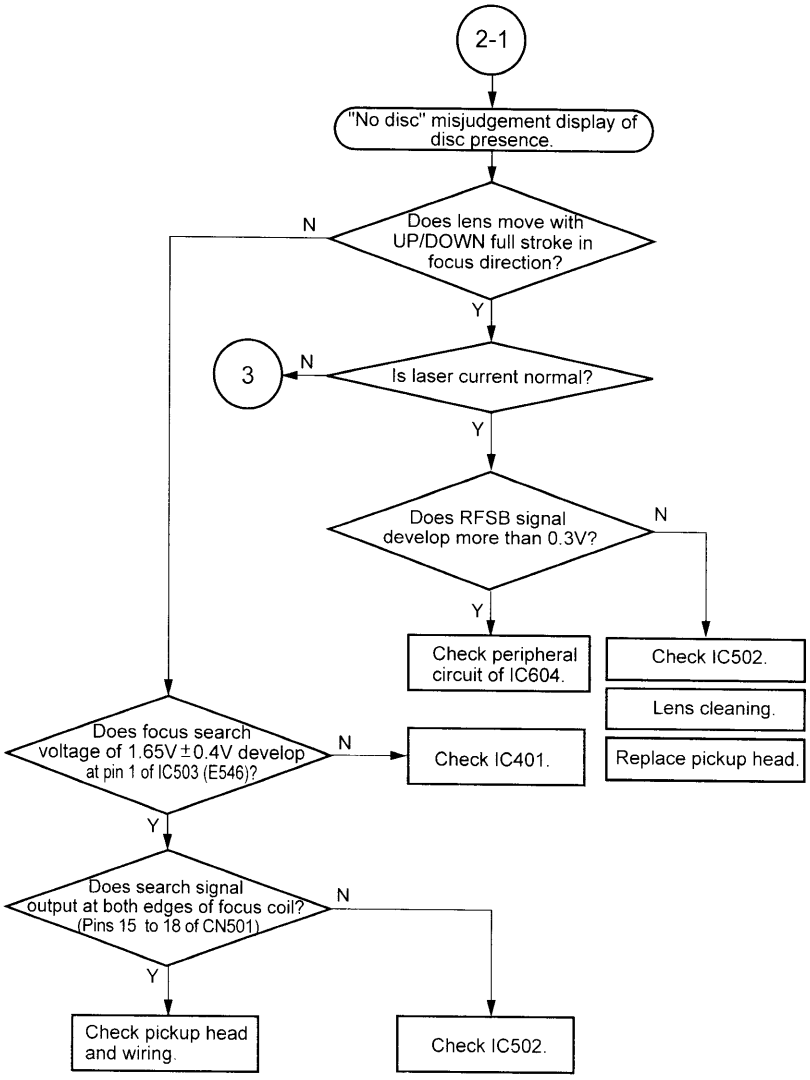


Fig. 1-3-3

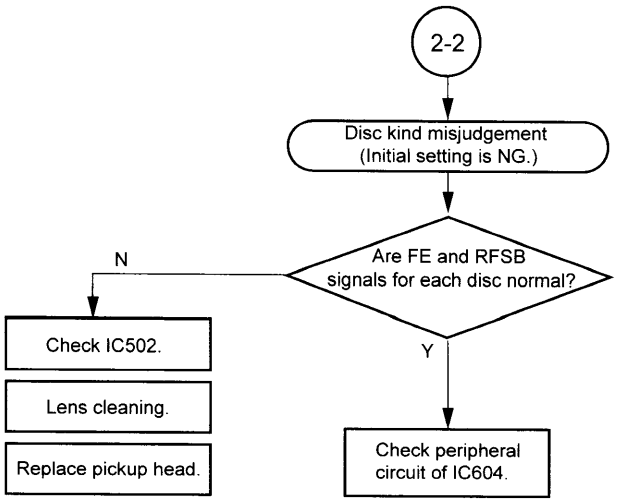
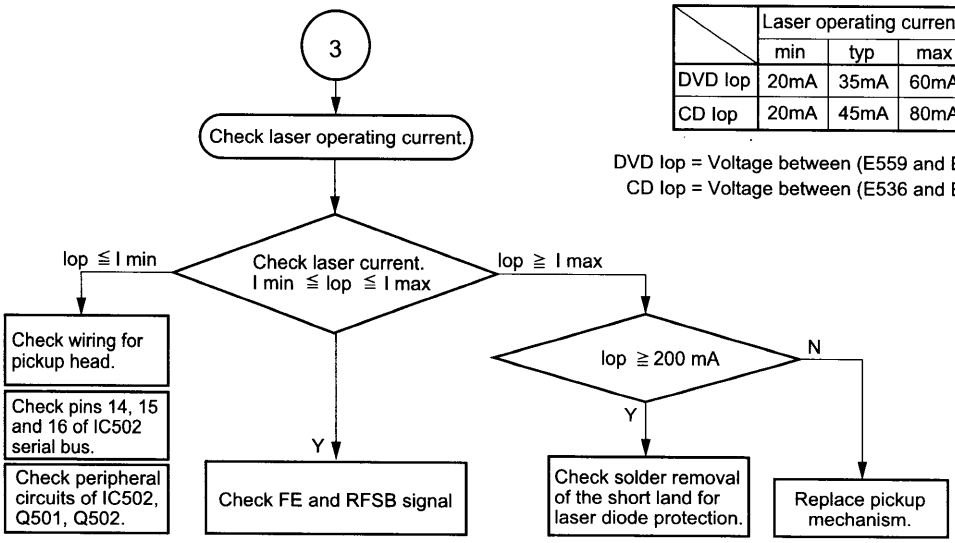


Fig. 1-3-4



	Laser operating current		
	min	typ	max
DVD Iop	20mA	35mA	60mA
CD Iop	20mA	45mA	80mA

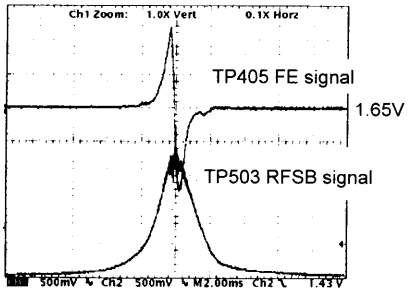
DVD Iop = Voltage between (E559 and E534) /10Ω
CD Iop = Voltage between (E536 and E534) /10Ω

To turn on each laser diode forcibly, press the following buttons on the remote controller.
DVD LD: ZOOM, 0, 3, 0, ZOOM
CD LD: ZOOM, 0, 3, 1, ZOOM
After checked the laser current, press POWER or OPEN/CLOSE button to turn it off.

CAUTION
- The laser ray emitting out from the pickup head is very harmful to your eyes.
  Keep your eyes from the objective lens at least 300mm distance during the pickup head operating.
- When you perform solder removal work, please turn OFF a set power supply and perform the ground of human body and a tool.

Fig. 1-3-5

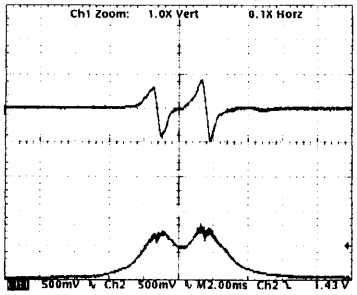
DVD single (single-layer) disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-6

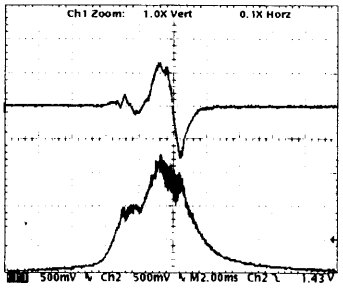
DVD dual (dual-layer) disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-7

CD disc detection waveform



V : 500 mV/div
H : 2 ms/div

Fig. 1-3-8

(2) Picture appears (PLAY)

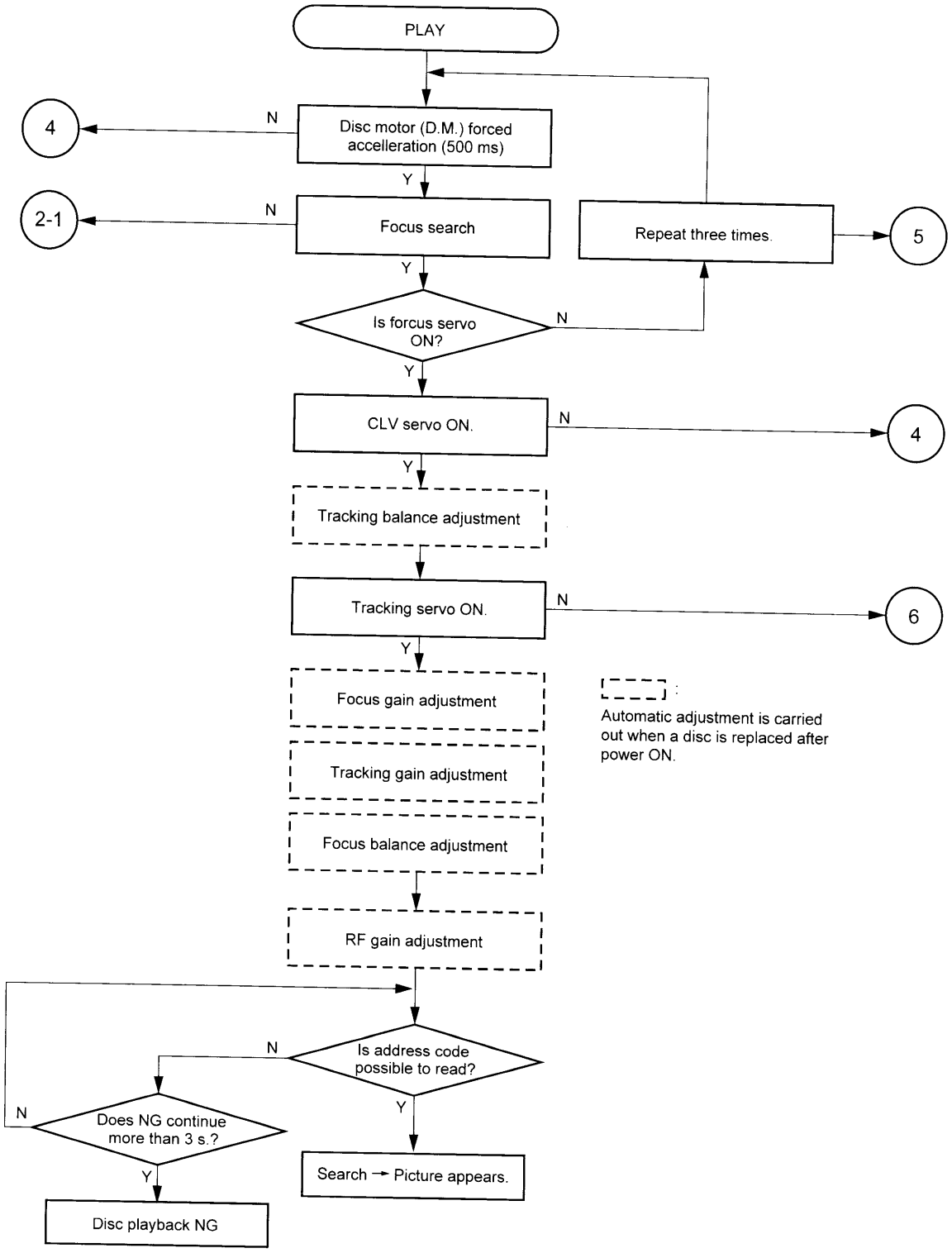


Fig. 1-3-9

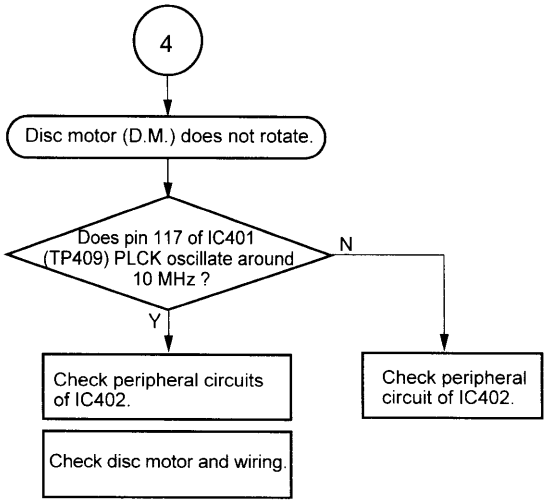

4
Disc motor (D.M.) does not rotate.
Does pin 117 of IC401 (TP409) PLCK oscillate around 10 MHz ?
N
Y
Check peripheral circuits of IC402.
Check peripheral circuit of IC402.
Check disc motor and wiring.

Fig. 1-3-10

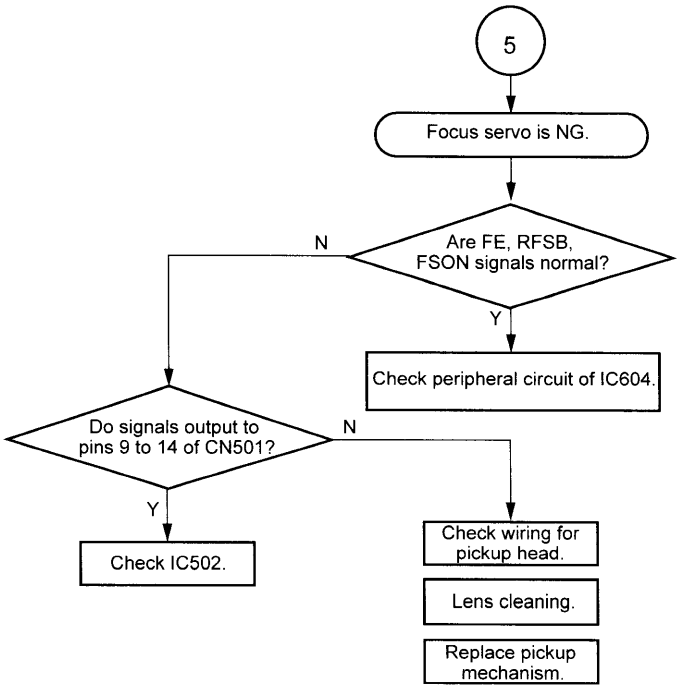


Fig. 1-3-11

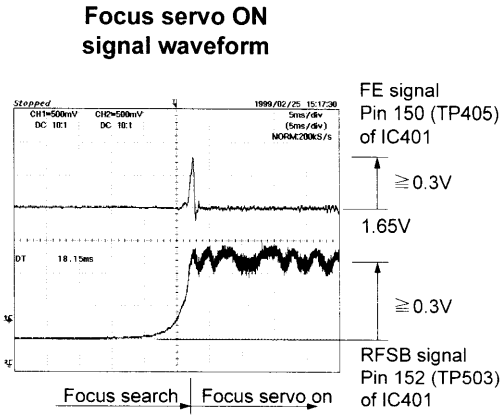


Fig. 1-3-12

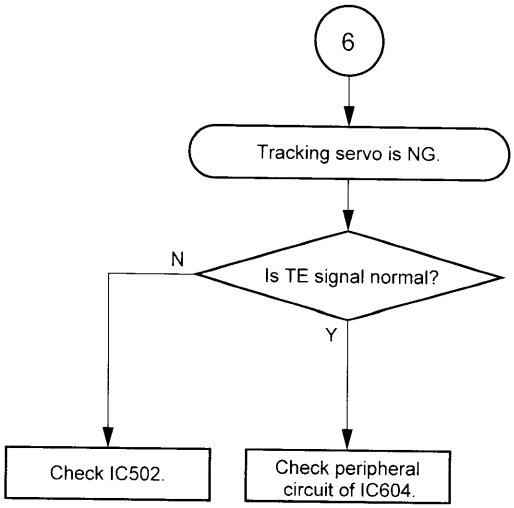
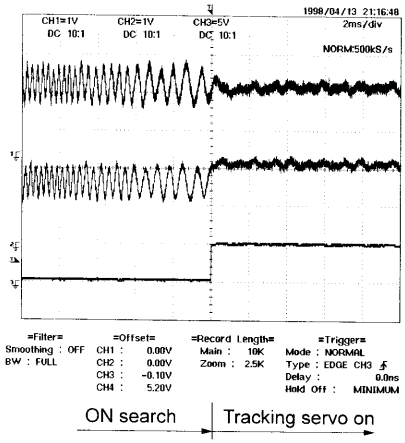


Fig. 1-3-13

Signal waveform at tracking servo ON (CD)


1998/04/13 21:16:48
CH1=1V DC 10:1
CH2=1V DC 10:1
CH3=5V DC 10:1
2ms/div
NORM:500kS/s
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : -0.10V CH4 : 5.20V
=Record Length= Main : 10K Zoom : 2.5K
=Trigger= Mode : NORMAL Type : EDGE CH3 Delay : 0.0ns Hold Off : MINIMUM
ON search
Tracking servo on

TE signal
Pin 151 (TP406) of IC401
1.65V

RFRP signal
Pin 153 (TP408) of IC401

Search ON (SRCH)
Pin 38 (TP411) of IC401

Fig. 1-3-14

Signal waveform at tracking servo ON (DVD)

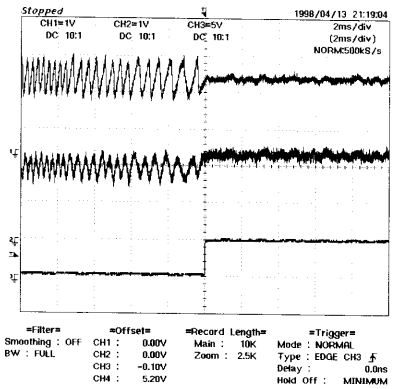

Stopped
1998/04/13 21:19:04
CH1=1V DC 10:1
CH2=1V DC 10:1
CH3=5V DC 10:1
2ms/div
(2ms/div)
NORM:500kS/s
=Filter= Smoothing : OFF BW : FULL
=Offset= CH1 : 0.00V CH2 : 0.00V CH3 : -0.10V CH4 : 5.20V
=Record Length= Main : 10K Zoom : 2.5K
=Trigger= Mode : NORMAL Type : EDGE CH3 Delay : 0.0ns Hold Off : MINIMUM

Fig. 1-3-15

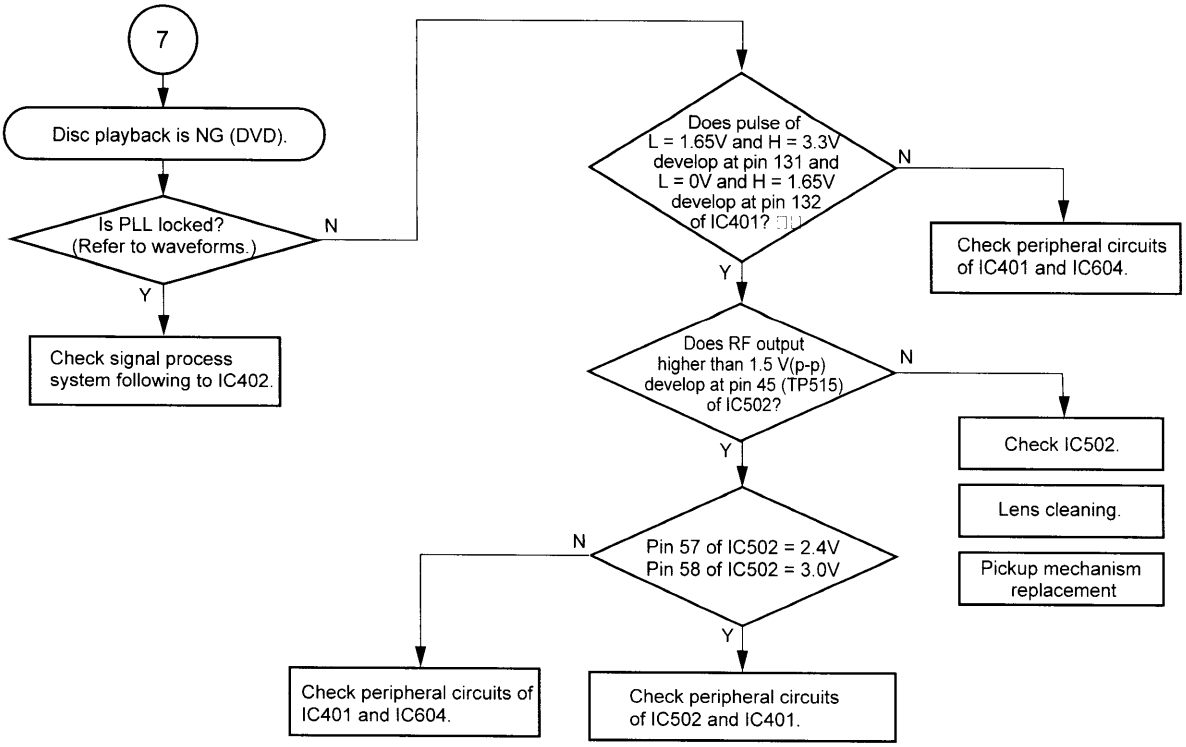
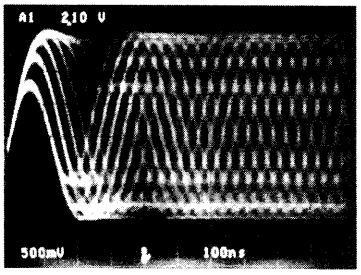

7
Disc playback is NG (DVD).
Is PLL locked? (Refer to waveforms.)
N
Y
Check signal process system following to IC402.
Does pulse of L = 1.65V and H = 3.3V develop at pin 131 and L = 0V and H = 1.65V develop at pin 132 of IC401?
N
Y
Check peripheral circuits of IC401 and IC604.
Does RF output higher than 1.5 V(p-p) develop at pin 45 (TP515) of IC502?
N
Y
Check IC502.
Lens cleaning.
Pickup mechanism replacement
Pin 57 of IC502 = 2.4V Pin 58 of IC502 = 3.0V
N
Y
Check peripheral circuits of IC401 and IC604.
Check peripheral circuits of IC502 and IC401.

Fig. 1-3-16

PLL works as a servo loop to generate a clock signal for reading RF signal binary data. With the PLL locked, the eye pattern is identified clearly when triggered with the read clock PLCK.

DVD RF signal

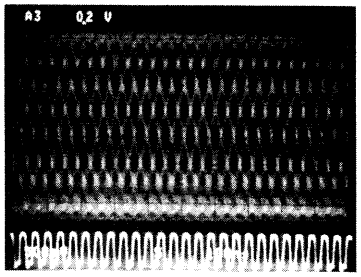


DVD RF signal
Pin 45 (TP502) of IC502

V : 500 mV/div
H : 50 ns/div

Fig. 1-3-17

DVD playback waveform



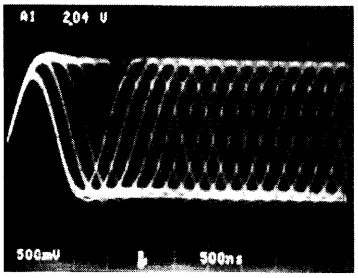
DVD RF signal
Pin 45 (TP502) of IC502

DVD PLCK
Pin 117 (TP409) of IC401

CH1 : TP515 DVDRF 500 mV/div
CH2 : TP511 DVDPLCK 5 V/div
50 ns/div

Fig. 1-3-19

CD RF signal

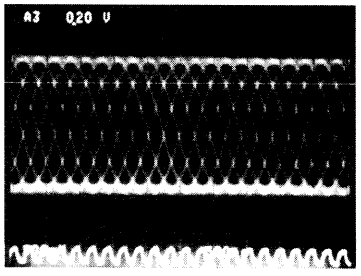


CD RF signal
Pin 45 (TP502) of IC502

V : 500 mV/div
H : 100 ns/div

Fig. 1-3-18

CD playback waveform



CD RF signal
Pin 45 (TP502) of IC502

CD PLCK
Pin 117 (TP409) of IC401

CH1 : TP502 CDRF 500 mV/div
CH2 : TP409 CDPLCK 5 V/div
100 ns/div

Fig. 1-3-20

3-1-2. Location Diagram of Servo Test Point

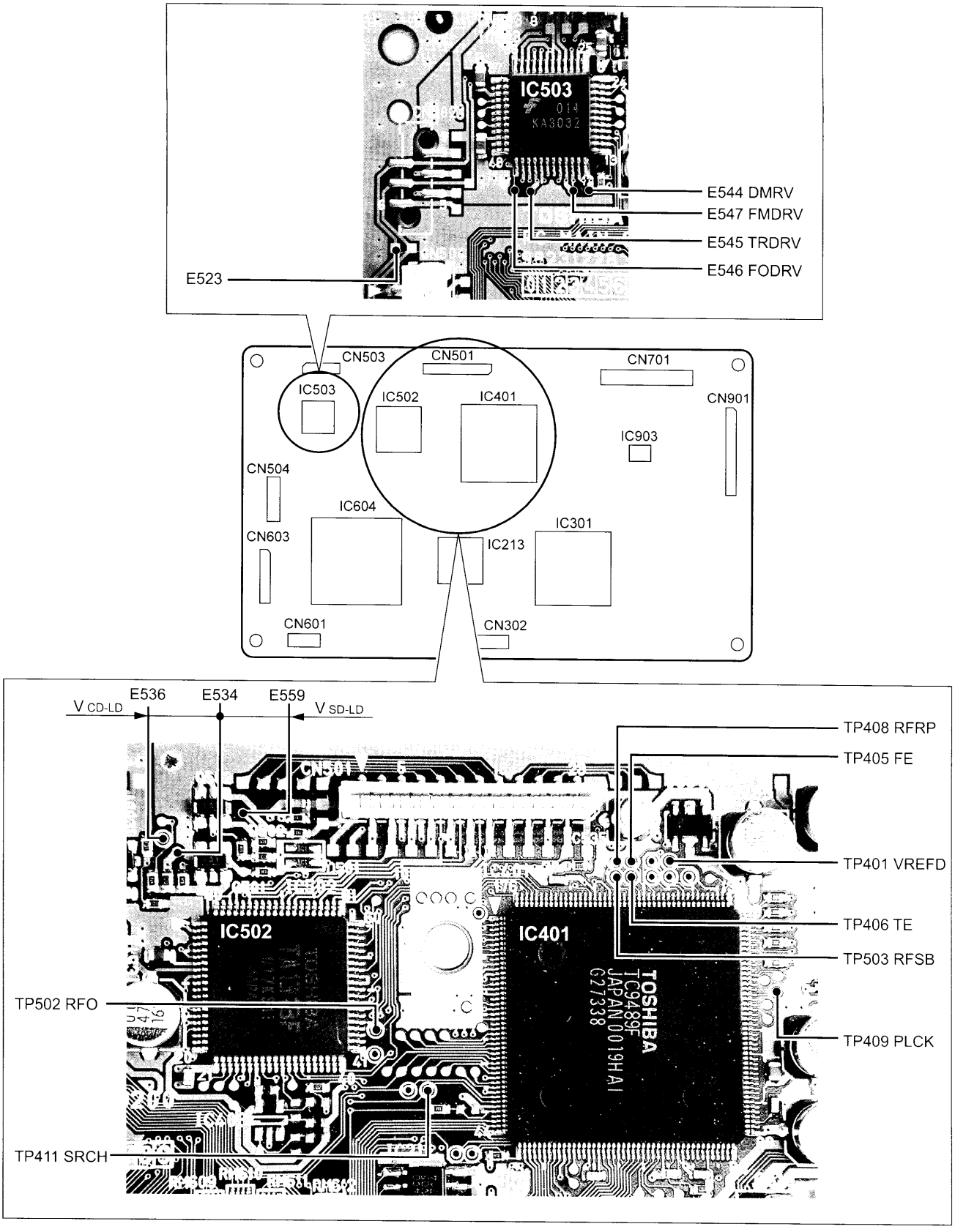


Fig. 1-3-21

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

CAUTIONS BEFORE STARTING SERVICING

Electronic parts are susceptible to static electricity and may easily damaged, so do not forget to take a proper grounding treatment as required.

Many screws are used inside the unit. To prevent missing, dropping, etc. of the screws, always use a magnetized screwdriver in servicing. Several kinds of screws are used and some of them need special cautions. That is, take care of the tapping screws securing molded parts and fine pitch screws used to secure metal parts. If they are used improperly, the screw holes will be easily damaged and the parts can not be fixed.

1. REPLACEMENT OF MECHANICAL PARTS

1-1. Cabinet Replacement

1-1-1. Top Cover

1. Remove eight screws (1) and three screws (2), and then remove the top cover (3).

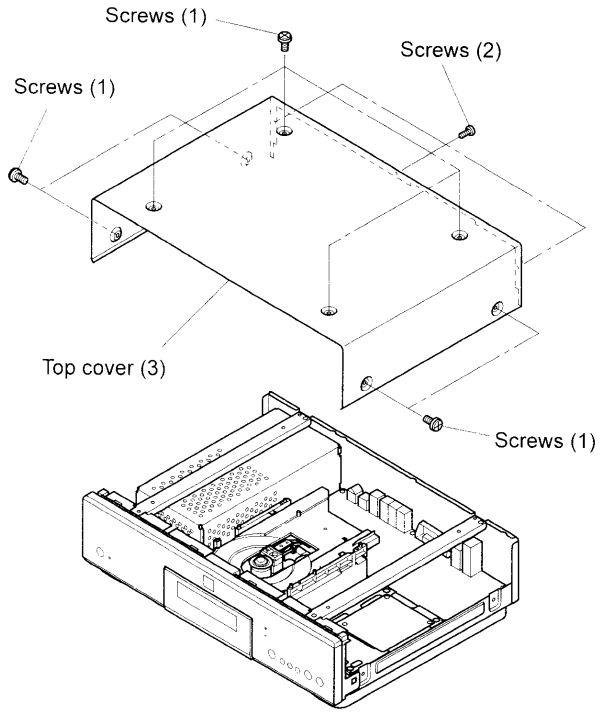


Fig. 2-1-1

1-1-2. Bottom Plate

1. Remove four screws (2) fixing each foot (1).
2. Remove the feet (1) attached by both-side adhesive tape with a screwdriver, etc.

Note:

- At this time, use a soft cloth on the tip of the screwdriver not to damage the bottom plate.

3. Remove seven screws (3).
4. Remove the bottom plates (4) and (5).
5. Remove four screws (6) and remove the bottom plate (7).

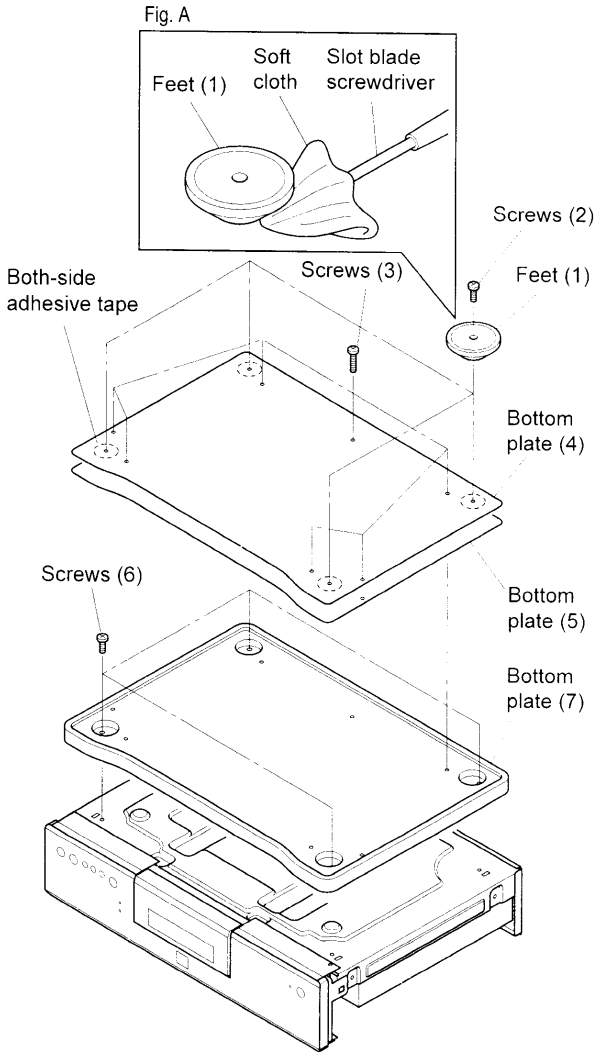


Fig. 2-1-2

1-1-3. Front Panel

1. Remove the bottom plate. (Refer to item 1-1-2.)
2. Remove four screws (1) and two stays (2).
3. Remove four screws (3).
4. Disconnect one flexible cable (4).
5. Release two claws and remove the front panel (5).

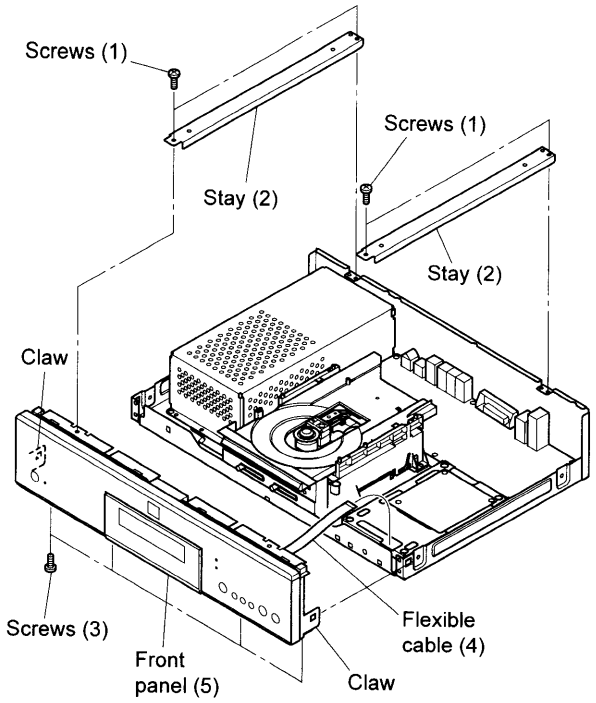


Fig. 2-1-3

Note:

- When mounting, bend the 13 pin flexible cable (4) connecting front to main PC boards to keep away from the top cover.

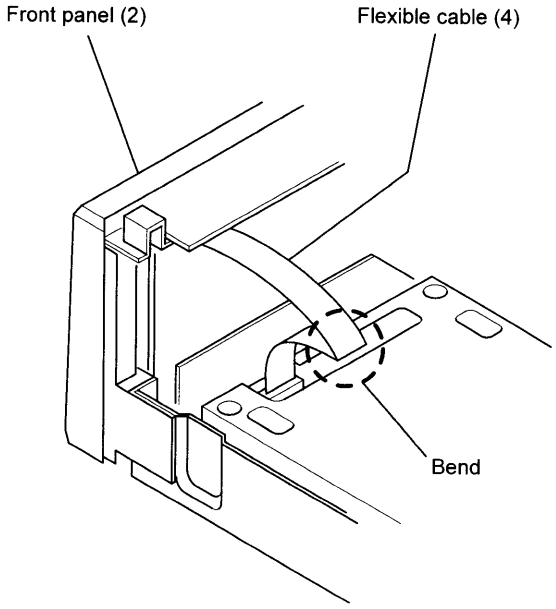


Fig. 2-1-4

1-1-4. Rear Panel

<Removal>

1. Remove the stays. (Refer to item 1-1-3.)
2. Remove seventeen screws (1) and remove the rear panel (2).
3. Remove one hexagon nut (3) with the washer (4) to remove the lead wire with a lug terminal (5).

Note:

- The metal part (6) is released.

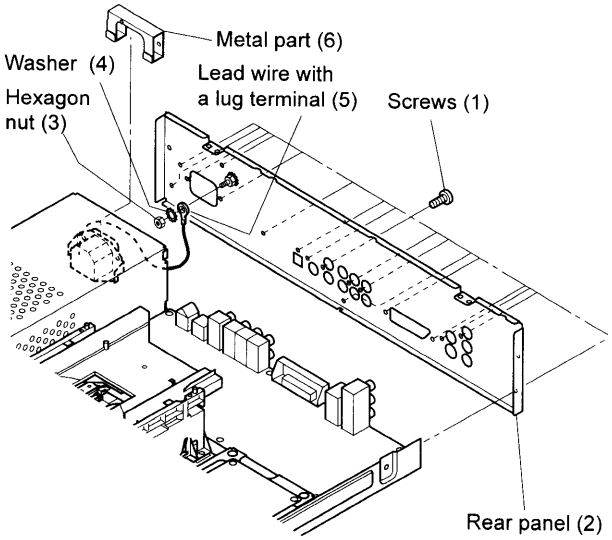


Fig. 2-1-5

<Mounting>

Note:

- The metal part (6) may be released when removing the rear panel (2). If it is released, refer to the procedures below when mounting.

1. Remove two screws (7), and then remove the power supply shield cover (8).
2. Fix the lead wire with a lug terminal (5) by using the hexagon nut (3) with the washer (4).
3. Match the screw holes of the metal part (6) and AC inlet (9), and then mount the rear panel (2) with two screws (1).
4. Mount the power supply shield cover (8) with two screws (7).
5. Tighten the screws (1) left.

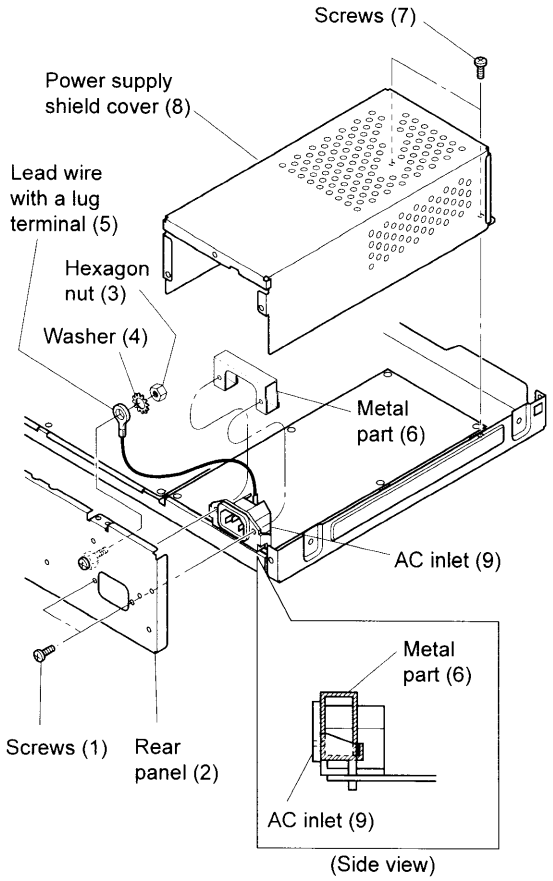


Fig. 2-1-6

1-2. PC Board Replacement

Note:

- Perform the wiring between power supply, main and output PC boards as followings. Pay attention for the wiring when mounting.

1. Bind the wires from the power supply PC board with the wire clamp (1) and keep then up away from the output PC board (approx. 20mm).
2. Bind the 13 wires from the main PC board with the wire clamp (3) and keep then up away from the output PC board (approx. 20mm).
3. Draw the wire in the arrow A direction not to leave slack on the power supply PC board side. Bind the wire with the binding bands (4) at the positions shown by the arrows B and C (2 locations) not to be twisted.
4. Pass the 8 wires (5) between the capacitors CS09 and CS10.
5. Press down the wires twice or three times approx. at the center position between the binding bands B and C to fit the wires along the surface of output PC board. This is to prevent the wires from interrupting the tray motion.

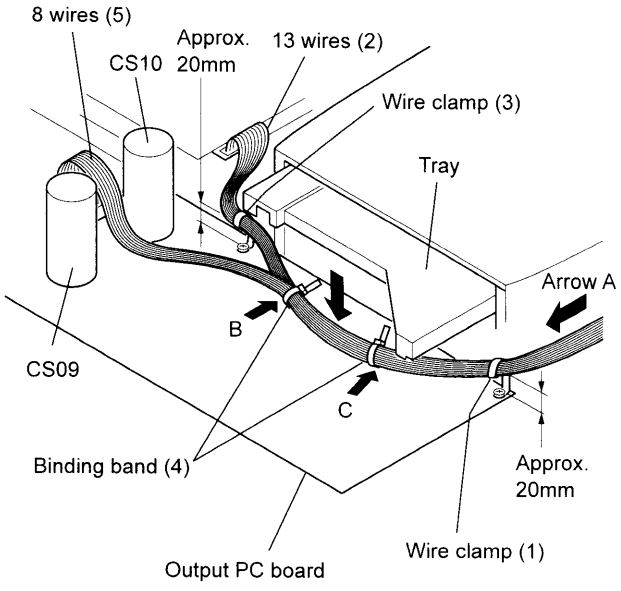


Fig. 2-1-7

1-2-1. Sub Video PC Board

1. Disconnect one flexible cable (1).
2. Remove three screws (2) and remove the sub video PC board (3).

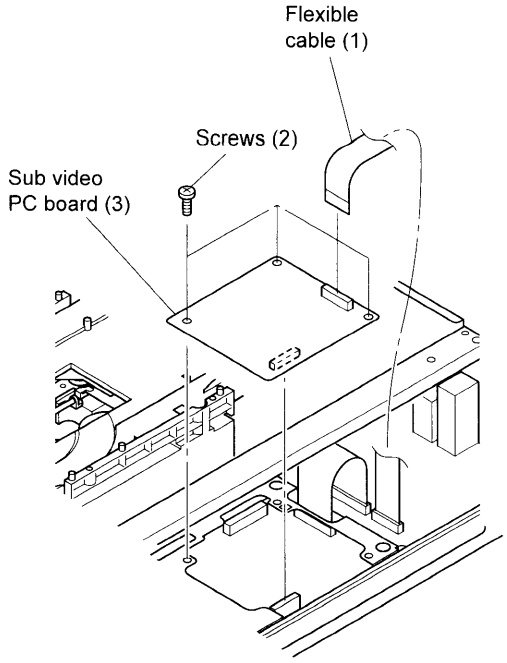


Fig. 2-1-8

1-2-2. Main PC Board

Note:

- Before removing the main PC board (4), be sure to short-circuit the laser diode output land.
  After replacing, open the land after inserting the connectors and flexible cables.

1. Remove the sub video PC board (Refer to item 1-2-1.)
2. Remove one connector (1).
3. Peel off the tape (2) and pull out the wire bound with a binding band from the clearance between the chassis and the shield cover (4).
4. Disconnect one connector (5) and three flexible cable (6).
5. Remove four screws (7) and remove the shield cover (4).
6. Remove the main PC board (8).

Note:

- When mounting, push the wire bound with a binding band into the clearance between the chassis and the shield cover (4) and fix the wire with the tape (2).

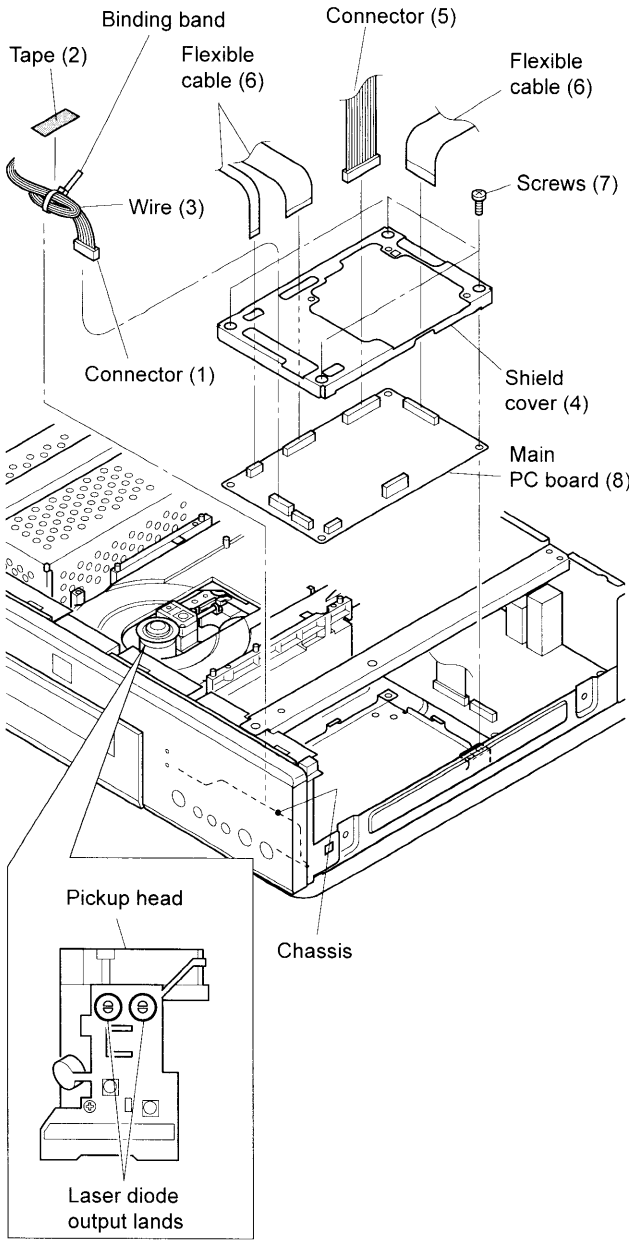


Fig. 2-1-9

1-2-3. Output PC Board

1. Remove the rear panel. (Refer to item 1-1-4.)
2. Remove one connector (1) and remove two flexible cables (2).
3. Remove six screws (3) and remove the output PC board (4).

Note:

- When mounting the output PC board, bind the wire (5) with the wire clamp (6).

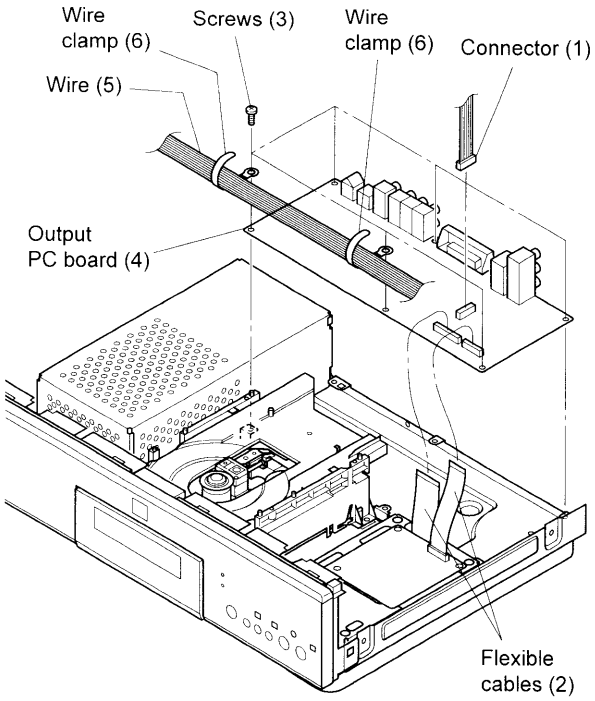


Fig. 2-1-10

1-2-4. Power Supply PC Board

1. Remove two screws (1) and remove the stay (2).
2. Remove three screws (3) and two screws (4), and then remove the power shield cover (5).
3. Remove the metal part (6).
4. Remove three connectors (7).
5. Remove one hexagon nut (8) and washer (9) to remove the lead wire with a lug terminal (10).
6. Remove two screws (11) and five screws (12), and then remove the power supply PC Board (13).

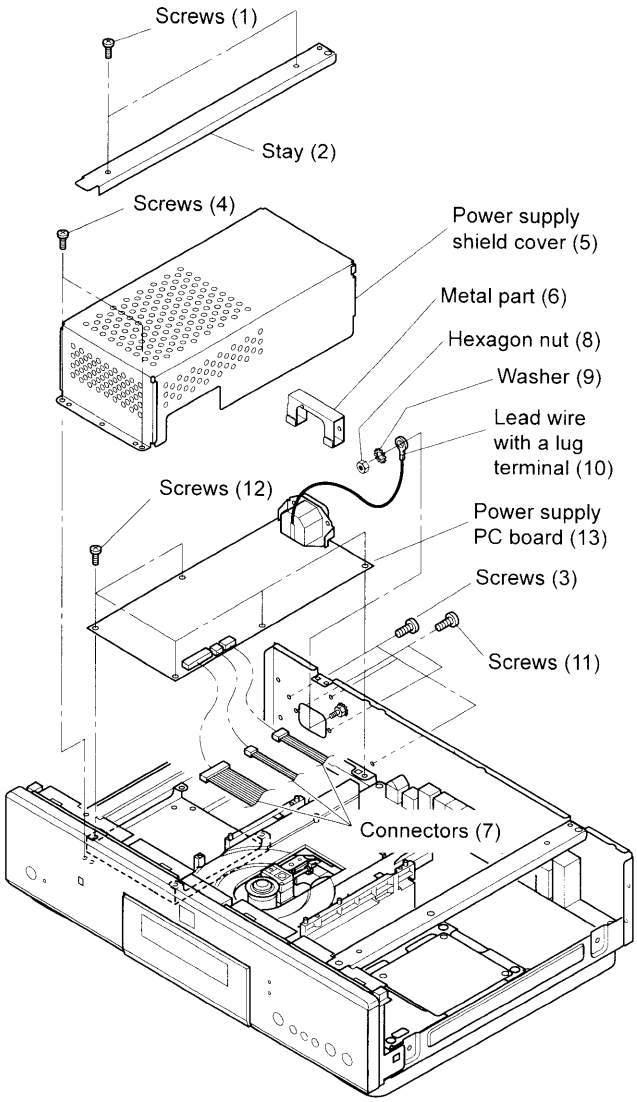


Fig. 2-1-11

1-2-5. Front and Power SW PC Boards

1. Remove the front panel. (Refer to item 1-1-3.)
2. Disconnect two flexible cables (1).
3. Remove three screws (2) and release six claws (A), and then remove the front PC board (3).
4. Remove one screw (4) and release four claws (B), and then remove the power switch PC board (5).

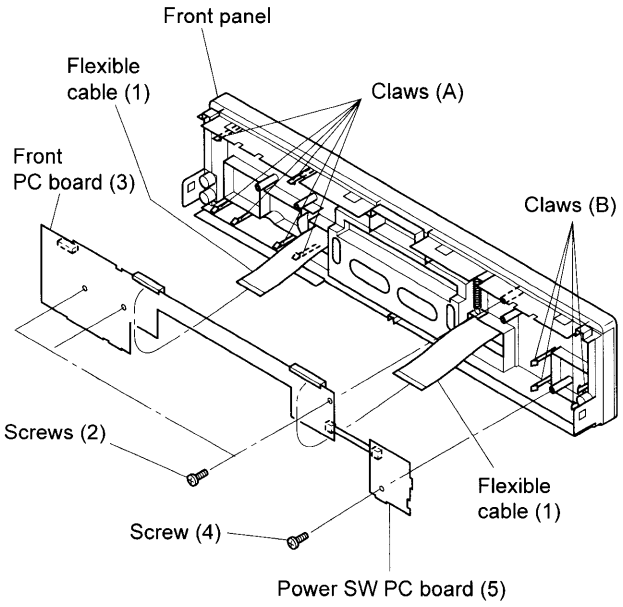


Fig. 2-1-12

1-2-6. Display PC Board

1. Remove the front panel. (Refer to item 1-1-3.)
2. Remove the front PC board and the power switch PC board. (Refer to item 1-2-5.)
3. Remove two screws (1).
4. Remove the holder (2) and the LED cover (3).
5. Remove two springs (4).
6. Release four claws (A) and remove the aluminum panel (11).
7. Slide the plate (5) upward.
8. Remove the display assembly (6).
9. Remove four screws (7) and remove the display cover (8).
10. Release three claws (B) and remove the display PC board (9).
11. Disconnect two flexible cables (10).
12. Perform the reverse steps of removal described above for mounting.

Note:

- Mount the holder (2) and LED cover (3) after mounting the plate (5) and the aluminum panel (11). (Refer to Fig. A.)

  (The projection of the LED cover (3) may be broken.)

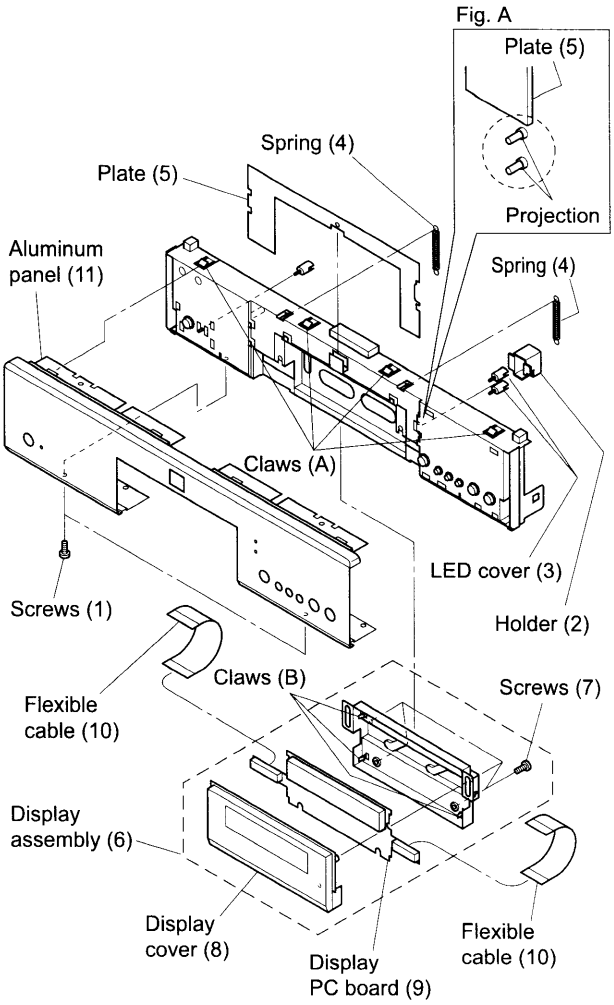


Fig. 2-1-13

1-3. Mechanism Parts Replacement

1-3-1. Mechanism Chassis Assembly

Note:

- Before removing the connectors and flexible cables, be sure to short-circuit the laser diode output land. After replacing the mechanism chassis assembly, open the land after inserting the connectors and flexible cables.

1. Remove four screws (1) and remove the mechanism cover (2).
2. Remove one connector (3).
3. Peel off the tape (4), and pull out the wire part (5) bound with the binding band from the clearance between the chassis and the shield cover.
4. Remove one flexible cable (6).
5. Remove four screws (7) and remove the mechanism chassis assembly (8).
6. Remove one flexible cable (9).

Note:

- When mounting, pass the wire (5) through the groove and wind it to the claw as shown in Fig. A.

  Push the wire bound with a binding band into the clearance between the chassis and the shield cover and fix the wire with the tape (4).

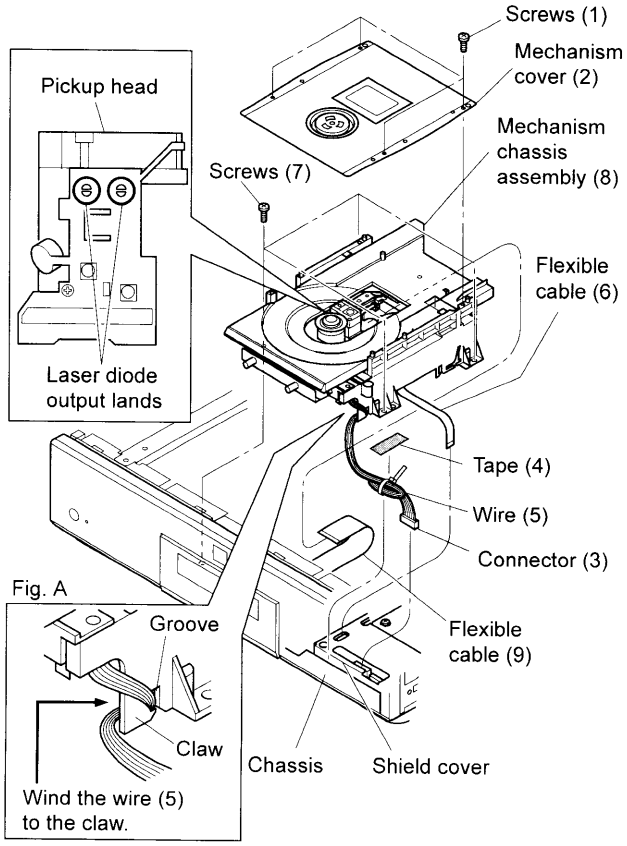


Fig. 2-1-14

Note:

- When connecting the flexible cable (9), pass it through the hole of the mechanism chassis assembly (8).

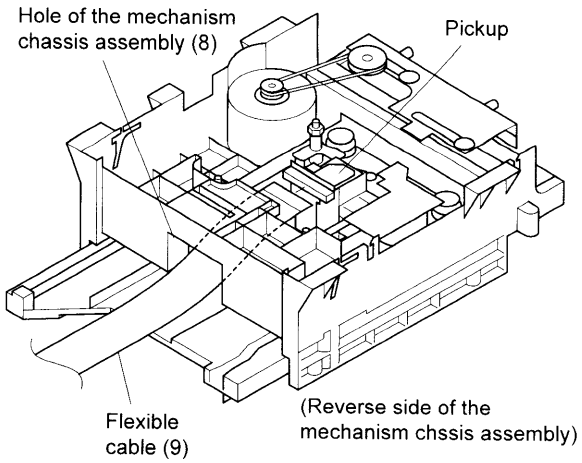


Fig. 2-1-15

Note:

- Locate the flexible cable (9) on the chassis, and fix it with one tape.

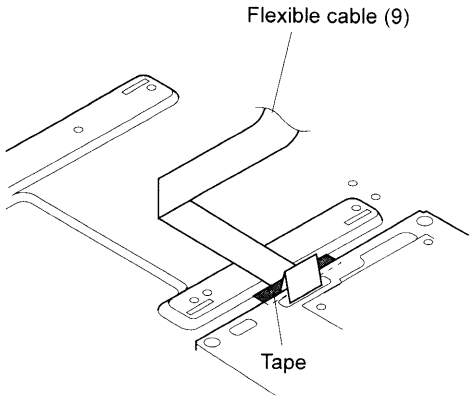


Fig. 2-1-16

1-3-2. Tray Assembly

<Removal>

1. Slide the display part drive slider (1) in the direction A and pull out the tray assembly (2) to this side.
2. Remove one screw (3) and remove the tray rail guide (right) (4).
3. Remove two screws (5) and remove the tray rail guide (left) (6).
4. Remove the tray assembly (2) from the mechanism chassis assembly (7).

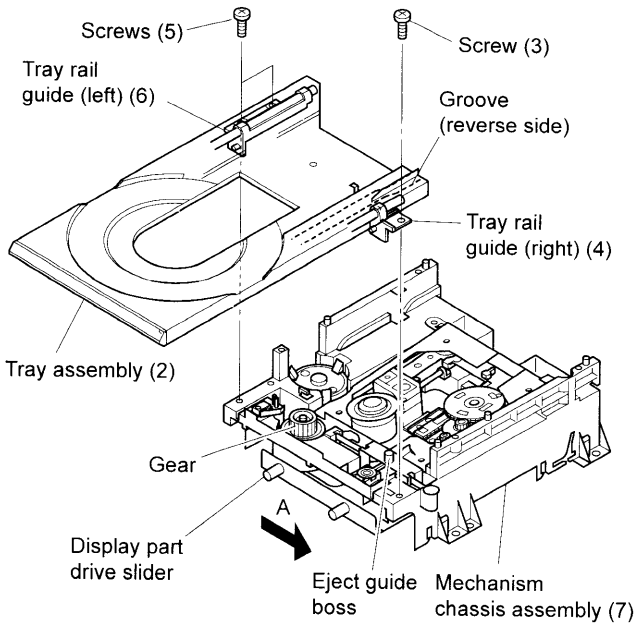


Fig. 2-1-17

<Mounting>

1. Slide the display part drive slider (1) in the direction A.
2. Match the eject guide boss on the mechanism chassis (7) with the tray groove and put the tray assembly (2) on the mechanism chassis (7). (Refer to Fig. B.)
3. Mount the tray rail guides (4) and (5) on the left and right of the tray assembly (2) to the mounting positions on the mechanism chassis assembly and fix them by tightening with one screw (3) and two screws (6). (Refer to Fig. B.)

Note:

- When the tray rail guides are correctly set to the mounting positions of the mechanism chassis assembly, the gear of the tray and that of the mechanism chassis assembly are engaged. (Refer to Fig. C.)

4. Slide the tray assembly (2) backward.

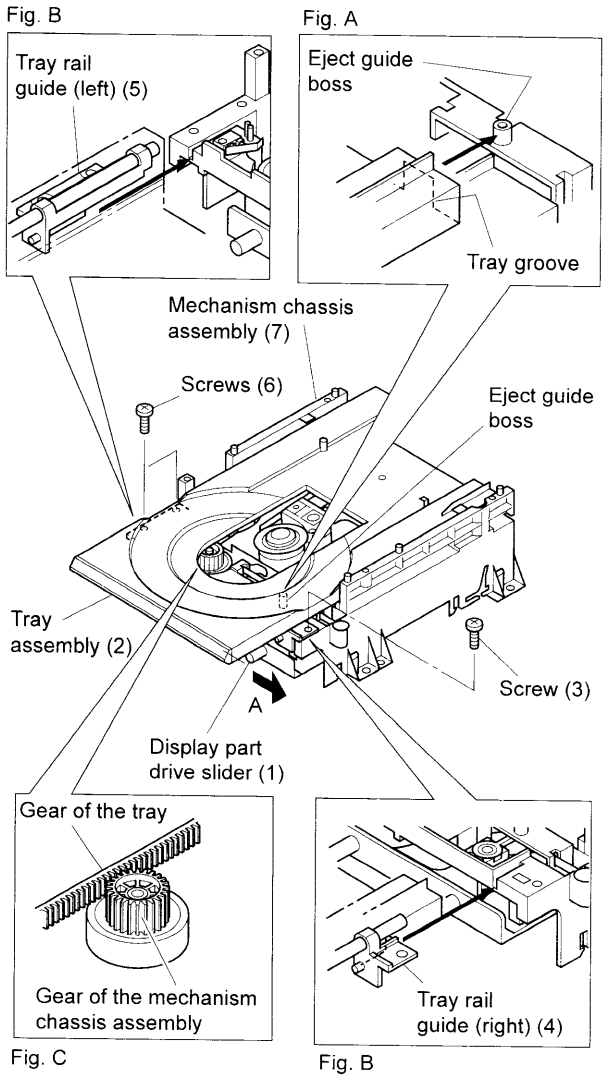


Fig. 2-1-18

1-3-3. Loading Belt, Loading Motor, Loading Gear

1. Eject the tray assembly. (Refer to item 1-3-2.)
2. Remove the loading belt (1).
3. Remove the poly slider washer (2) and remove the loading gear (3).
4. Desolder the terminal of the loading motor (4).
5. Release three claws (A) and remove the loading motor (4).

Note:

- When mounting the loading belt (1), take care not to twist it nor attach grease, etc.
- When replacing the loading motor (4), take care not to set the wrong polarity of the terminal.

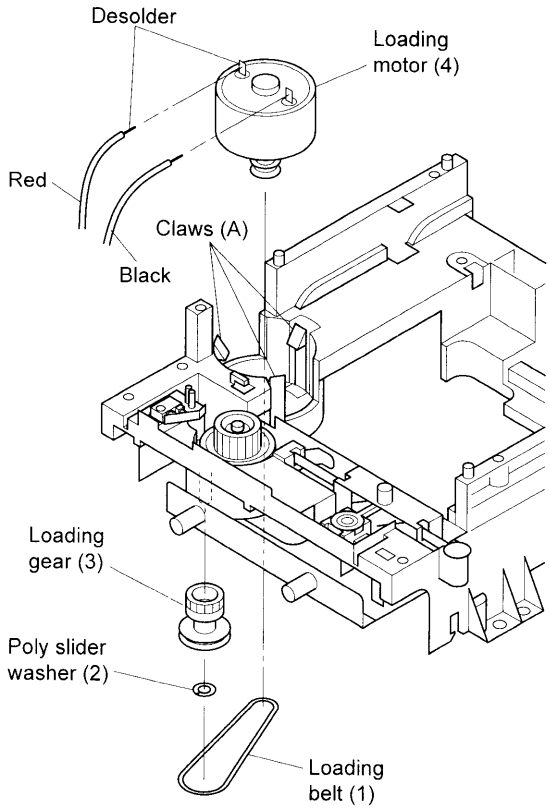


Fig. 2-1-19

1-3-4. Eject detection switch

1. Remove the tray assembly. (Refer to item 1-3-2.)
2. Remove one screw (1) and remove the eject detecti switch (2).
3. Desolder the terminal part.

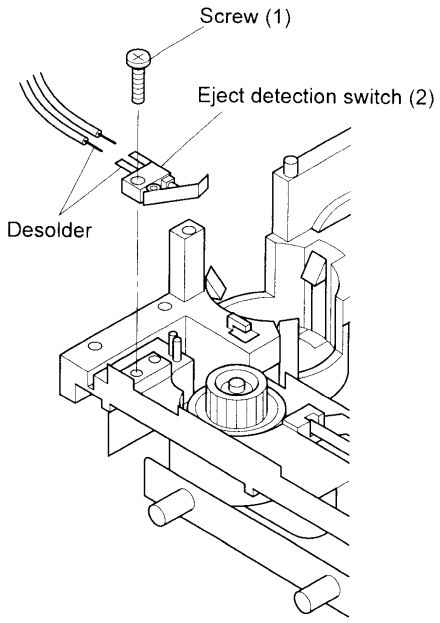


Fig. 2-1-20

1-3-5. Mechanism detection switch

1. Remove the tray assembly. (Refer to item 1-3-2.)
2. Remove one screw (1) and remove the mechanism detection switch (2).
3. Desolder the terminal part.

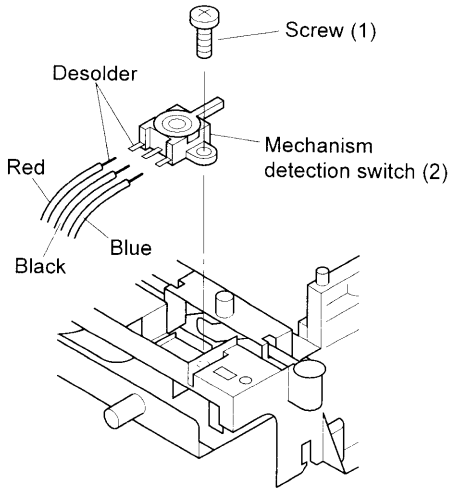


Fig. 2-1-21

1-3-6. Sub Chassis

1. Remove the tray assembly. (Refer to item 1-3-2.)
2. Disconnect one flexible cable (1).
3. Remove one screw (2) and remove the sub chassis (3).

Note:

- When mounting , insert three bosses of the sub chassis (3) (with the pickup mechanism) into the guides of the mechanism chassis assembly.

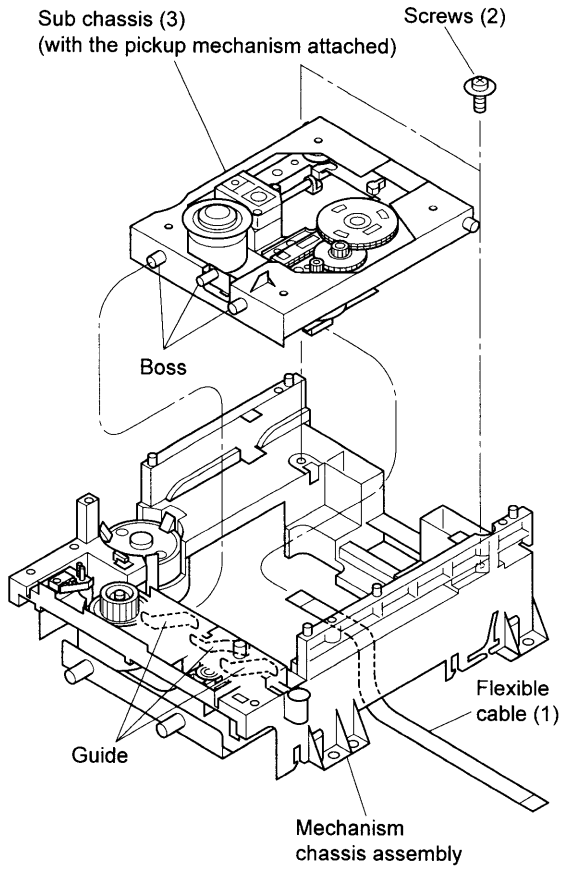


Fig. 2-1-22

1-3-7. Pickup Mechanism Assembly

<Removal>

1. Remove four screws (1) and remove the pickup mechanism assembly (2).

<Mounting>

1. Replace the pickup mechanism assembly (2) with a new one.

   Remove dampers from the pickup mechanism assembly replaced and mount the dampers on the new pickup mechanism assembly.

   Remove the screw (3) and bracket (4), and fix the bracket (4) on the new pickup mechanism assembly with the screw (3).
2. Perform the reverse steps of the removal described above for mounting.

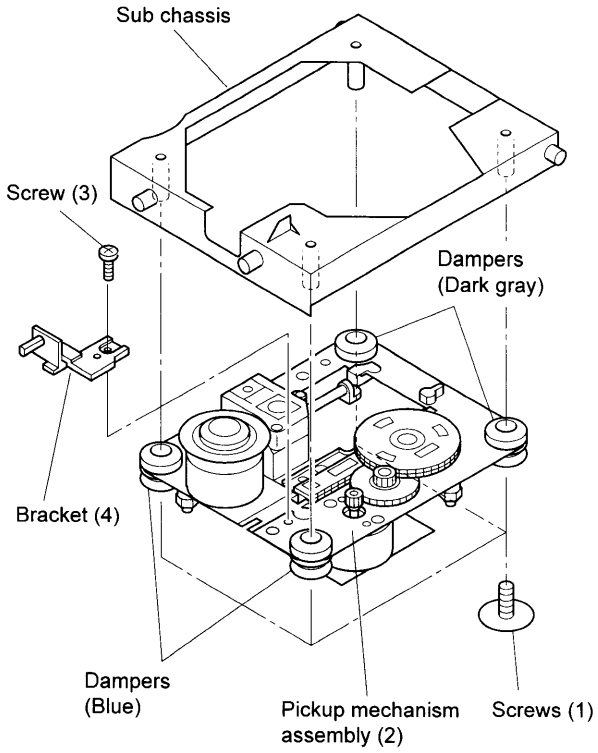


Fig. 2-1-23

Note:

- Do not misuse the dampers for the front side and the rear, since their color differs.
- When fixing the pickup mechanism assembly (2) with the screws (1), push the pickup mechanism assembly (2) downward not to catch the damper and tighten the screws (1) with the damper bent.

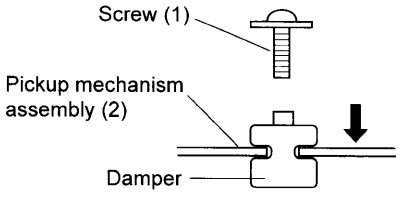


Fig. 2-1-24

1-3-8. Gear B Assembly, Gear A and Rack Gear Assembly

<Removal>

1. Remove one screw (1) and remove the gear B assembly (2).
2. Remove the gear A (3).
3. Remove one screw (4) and remove the rack gear assembly (5).

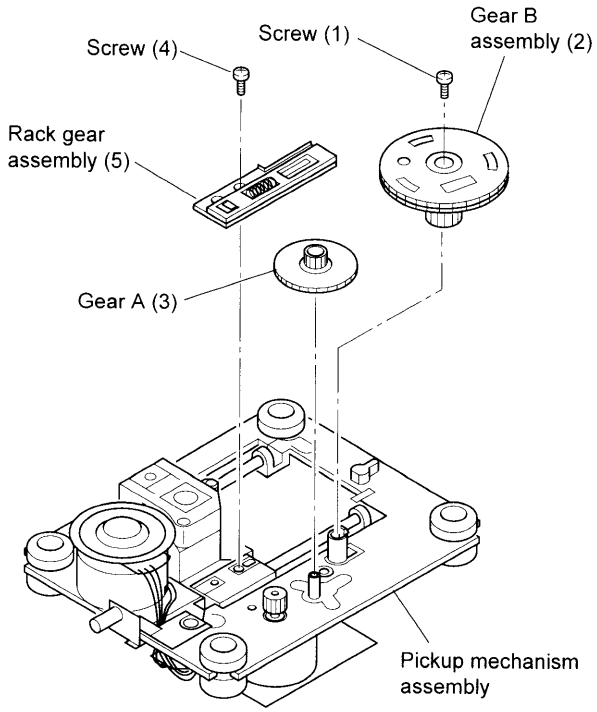


Fig. 2-1-25

<Mounting>

1. When mounting, perform the reverse order of the removal.
2. Mount the gear B assembly (1) by pushing the pickup head (5) to the disc motor side (arrow A direction) and shifting the upper gear of the rack gear assembly (4) in the arrow B direction. (Refer to Fig. 2-1-23.)
3. Fit the positioning holes on the upper gear and lower gear of the gear B assembly (1) and mount on the pickup mechanism assembly with the phase matched.

   At this time, note that the phase of the gear B assembly (1) and the gear A (2) is as shown in Fig. 2-1-24.

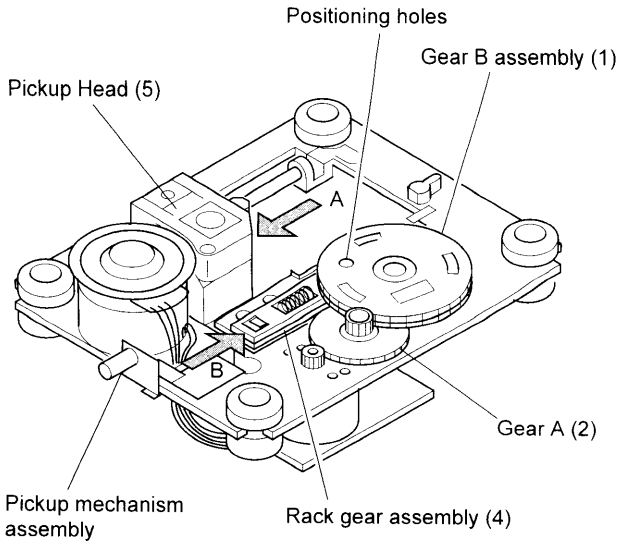


Fig. 2-1-26

Note:

- Mount the gear B assembly (1) and the gear A (2) with their gear teeth placed more than one tooth inside the shaded portion.

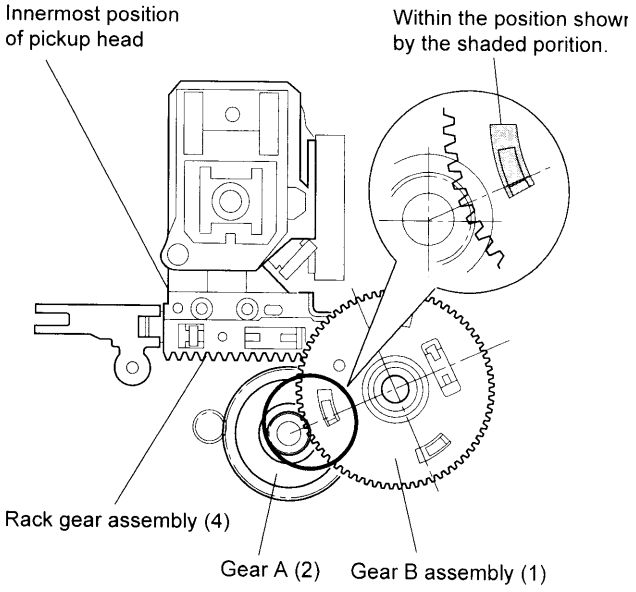

Innermost position of pickup head
Within the position shown by the shaded porition.
Rack gear assembly (4)
Gear A (2)
Gear B assembly (1)

Fig. 2-1-27

1-3-9. Feed Motor

<Removal>

1. Remove the gear B assembly (2) and the gear A (3). (Refer to item 1-3-8.)
2. Remove two screws (1) and remove the feed motor (2) (with the feed motor PC board (3) attached). (Refer to Fig. 2-1-25.)
3. Desolder the terminals of the feed motor (2) and remove the feed motor PC board (3).

<Mounting>

1. Tighten the feed motor (2) on the pickup mechanism assembly with the screws.
2. Insert the feed motor PC board (3) with the positioning pin on the chassis matched and solder the terminals.
3. Perform the reverse steps of the removal.

Note:

- When replacing the motor, take care not to set the wrong polarity of the terminal. (Note for the direction of the label.)

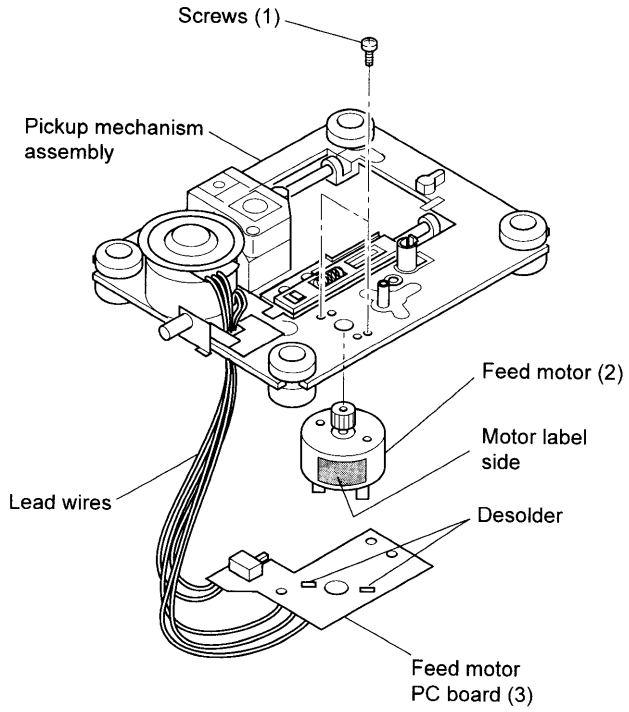


Fig. 2-1-28

SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ! (⚠) mark are critical for safety. Replace only with part number specified.
The mounting position of replacement is to be identical with originals.
The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

ABBREVIATIONS

1. Integrated Circuit (IC)

2. Capacitor (Cap)

- **Capacitance Tolerance (for Nominal Capacitance more than 10pF)**

Table 4-2-1

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20	± 30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+ 100 0	+ 30 – 10	+ 50 – 10	+ 75 – 10	+ 20 – 10	+ 100 – 10	+ 40 – 20	+ 150 – 10	+ 80 – 20

Ex. 10MF J = 10μF ± 5%

- **Capacitance Tolerance (for Nominal Capacitance 10pF or less)**

Table 4-2-2

Symbol	B	C	D	F	G
Tolerance pF	± 0.1	± 0.25	± 0.5	± 1	± 2

Ex. 10pF G = 10pF ± 2pF

3. Resistor (Res)

- **Resistance tolerance**

Table 4-3-1

Symbol	B	C	D	F	G	J	K	M
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20

Ex. 470ohmJ = 470ohm± 5%

EXVIEW

4. EXPLODED VIEWS

4-1. Packing Assembly

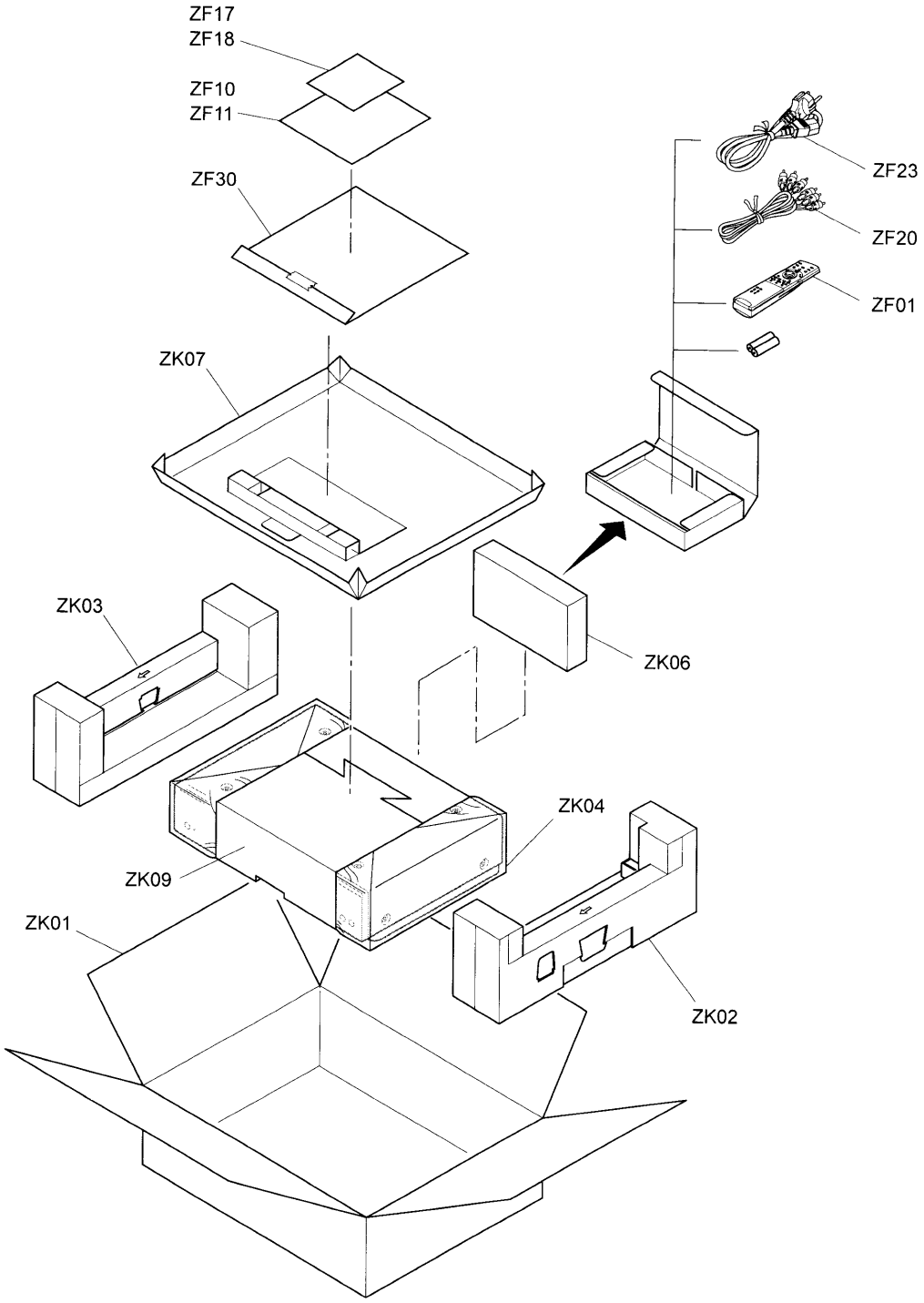


Fig. 4-4-1

4-2. Chassis Assembly

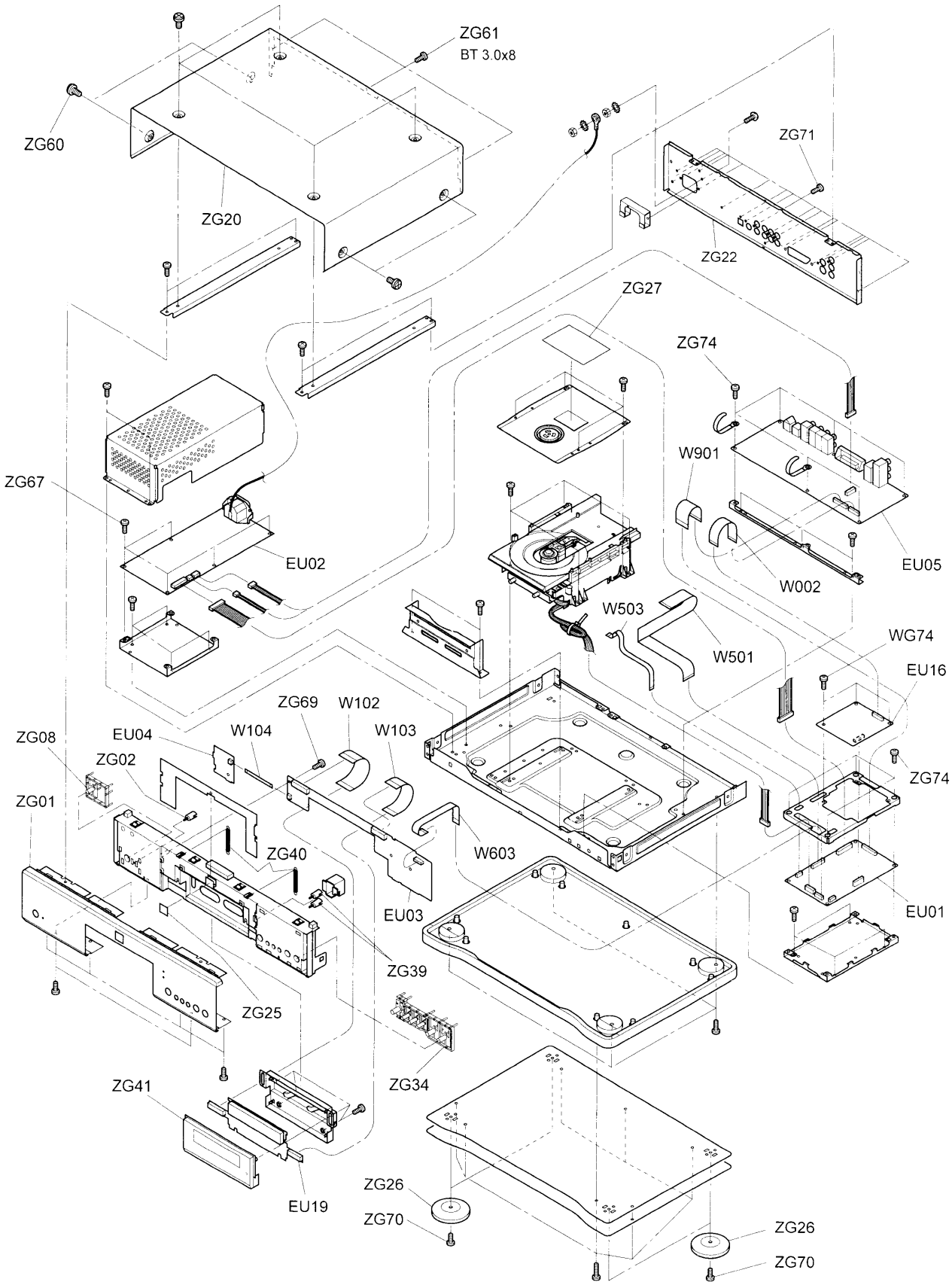


Fig. 4-4-2

EXVIEW

4-3. Mechanism Assembly

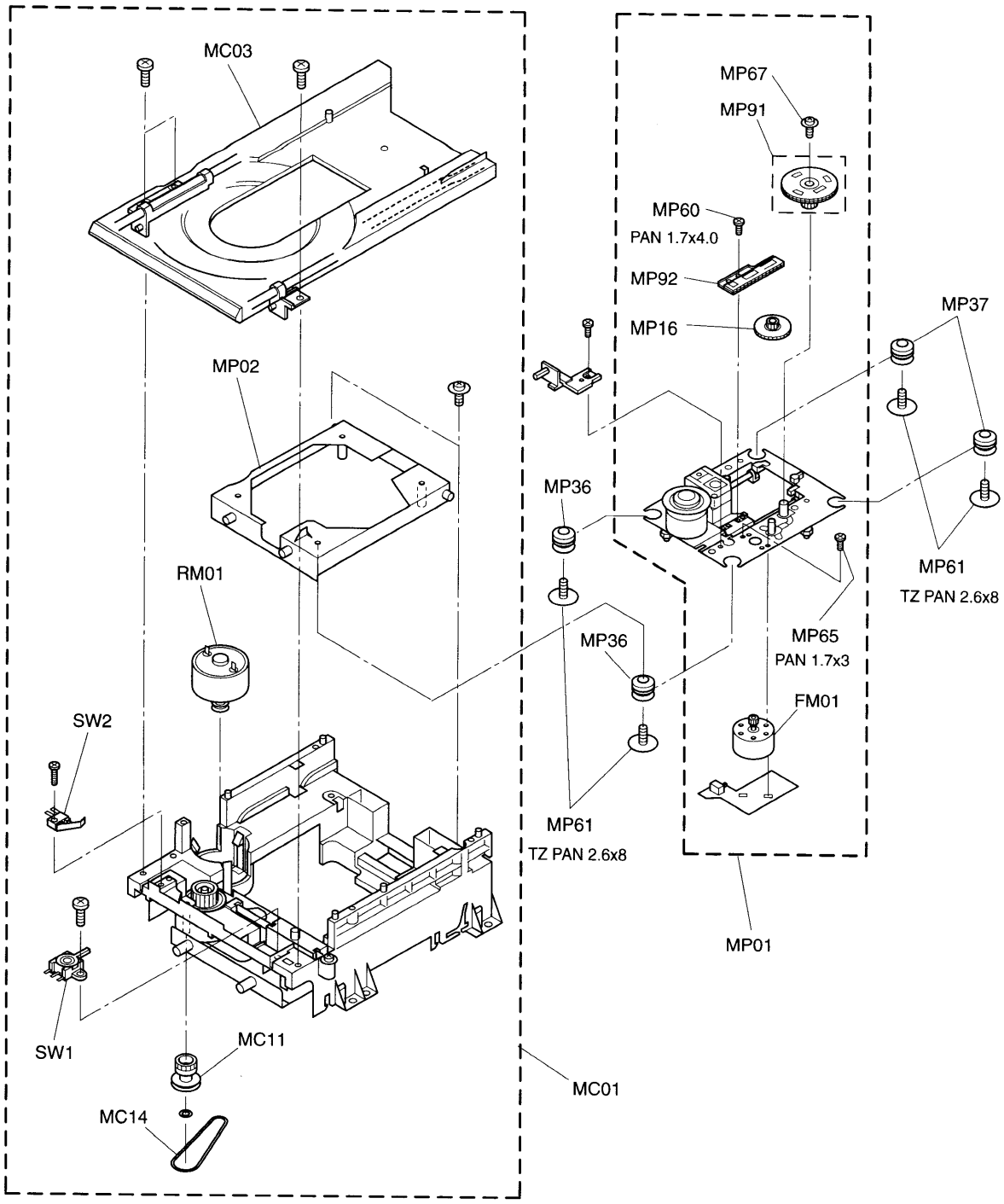


Fig. 4-4-3

5. PARTS LIST

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
		- MECHANICAL PARTS -	
FM01	79070421	Motor Assy, Feed	
MC01	79070482	Chassis Assy, Mechanism	
MC11	79070485	Gear, Pulley	
MC14	79070483	Belt, Loading	
MP01	79070470	Mechanism Assy, Pickup	
MP16	79070422	Gear	
MP36	79070486	Rubber, Dumper	Front
MP37	79070487	Rubber, Dumper	Rear
MP61	79070064	Screw	2.6x8W12mm
MP65	79079038	Screw	PAN1.7x3.0
MP91	79070419	Gear Assy, Kit B	
MP92	79070420	Gear Assy, Rack	
RM01	79070484	Motor Assy, Loading	
SW1	79089111	Lever, switch	
SW2	79089112	Lever, switch	
W002	79080256	Cable, Flexible	FFC, 18P, L90
W102	79080263	Cable, Flexible	FFC, 20P, L100D
W103	79080264	Cable, Flexible	FFC, 24P, L100D
W104	79080265	Cable, Flexible	FFC, 4P, L60
W501	79080261	Cable, Flexible	FFC, 23P, L352
W503	79080262	Cable, Flexible	FFC, 8P, L155
W603	79080197	Cable, Flexible	FFC, 13P, L150
W901	79080260	Cable, Flexible	FFC, 26P, L70
ZF01	79078060	Remote Control Unit, SE-R0039	
⚠ZF10	79077112	Owners Manual	English
⚠ZF11	79077113	Owners Manual	French/German
ZF16	79075127	Label, Shipping	
ZF20	79070037	Cable, AV	
⚠ZF23	79088026	Power Cord	
ZF30	79070042	Bag, Polyethylene	
ZG01	79071155	Front Panel	AL
ZG02	79071146	Lens, LED	Power
ZG08	79071158	Button, Power	
ZG20	79073076	Cover, Top	
⚠ZG21	79073078	Label, Rating	
ZG25	79071157	Plate, DVD	
ZG26	79073033	Foot Assy, Front	
⚠ZG27	79070469	Label, Caution	
ZG34	79071159	Buuton, Operation	
ZG39	79071147	Lens, LED	Audio/Video
ZG40	79070488	Spring	
ZG41	79071169	Case, Front	
ZG60	79079048	Screw	BID4.0x8
ZG61	79079047	Screw	BT3.0x8
ZK01	79075134	Case	
ZK02	79075123	Packing, R	
ZK03	79075124	Packing, L	
ZK04	79070033	Bag, Polyethylene	
ZK06	79075089	Box, Gift	
ZK07	79075125	Paking, Top	
ZK09	79075130	Sleeve	
ZZ01	79070274	Test Disc	DVDZ-9044
ZZ03	79080074	Kit, Data Update	

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
		- ELECTRICAL PARTS -	
■EU01	79083064	PC Board Assy	Main
		- INTEGRATED CIRCUITS -	
IC201	79040145	IC	NN514800AJ-60T
IC202	79040154	IC	TC203G08AF-0103Z
IC212	79040264	IC	S-24C02BFJ-TB
IC213	79040265	IC	REGULUS
IC301	79040243	IC	ZR36735
IC302	79040244	IC	S-816A25AMC-BAA
IC303	79040245	IC	HY57V651620B
IC304	79040123	IC	TC203G8AF-0101(Z)
IC305	79040128	IC	MSM51V8221A
IC401	79040224	IC	TC9489F
IC402	79040148	IC	V53C16128HK-30
IC501	79040006	IC	TC7S04F
IC502	79040225	IC	TC1313F
IC503	79040150	IC	KA3032
IC504	79040247	IC	S-814A33AUC-BCX
IC601	79040226	IC	S-24C01BFJ-TB-0
IC602	79040007	IC	TC7S08F
IC603	79040248	IC	S-80145CLMC-J16
IC604	79040230	IC	TMP94CS40AF-1A58
IC605	79040148	IC	V53C16128HK-30
IC606	79040153	IC	MBM29F800BA55TN
IC607	79040007	IC	TC7S08F
IC608	79040153	IC	MBM29F800BA55TN
IC609	79040007	IC	TC7S08F
IC610	79040087	IC	TC7W241FU
IC611	79040007	IC	TC7S08F
IC902	79040102	IC	NJM2370U05
IC903	79040227	IC	PLL1700E-T
IC905	79040249	IC	TC7SH08FU
IC907	79040266	IC	ZR38601
IC909	79040130	IC	NJU6321PE-TE1
IC910	79040087	IC	TC7W241FU
		- TRANSISTORS -	
Q301	79050079	Transistor, Chip	2SA1213-Y
Q302	79050043	Transistor, Chip	RN1402
Q401	79050014	Transistor, Chip	HN1C03F
Q501	79050015	Transistor, Chip	HN1B01F
Q502	79050015	Transistor, Chip	HN1B01F
Q601	79050031	Transistor, Chip	DTA114EKA
Q602	79050031	Transistor, Chip	DTA114EKA
Q901	79050043	Transistor, Chip	RN1402
Q902	79050043	Transistor, Chip	RN1402
		- DIODES -	
D501	79060022	Diode, Chip	1SS368
D502	79060022	Diode, Chip	1SS368
D901	79060022	Diode, Chip	1SS368
D902	79060022	Diode, Chip	1SS368
		- MISCELLANEOUS -	
X401	79089021	Oscillator, Ceramic	22.58MHz
X601	79089022	Oscillator, Ceramic	9.00MHz
X901	79089003	Oscillator	SMD49.27MHz
⚠■EU02	79085064	PC Board Assy	Power
		- INTEGRATED CIRCUITS -	
⚠Q801	79040267	IC	FA7615CP
Q821	79040146	IC	TA76431S
Q824	79040268	IC	TA79005S
Q826	79040222	IC	SI-3050CALF1101
Q827	79040223	IC	SI-3033CALF1101
Q881	79040146	IC	TA76431S
Q882	79040269	IC	BA05T
		- TRANSISTORS -	
⚠Q802	79050044	Photo Coupler	TLP621
⚠Q803	79050082	Transistor	2SK2769
Q822	79050005	Transistor	2SC2236-Y
Q823	79050040	Transistor	2SA1048-Y
Q828	79050076	Transistor	2SA1585STP-Q
Q829	79050004	Transistor	2SC2458-Y
⚠Q871	79050082	Transistor	2SK2769
⚠Q872	79050044	Photo Coupler	TLP621
⚠Q873	79050004	Transistor	2SC2458-Y
Q874	79050004	Transistor	2SC2458-Y
		- DIODES -	
⚠D802	79060016	Diode	ERA15-06
⚠D803	79060016	Diode	ERA15-06
⚠D804	79060016	Diode	ERA15-06
⚠D805	79060016	Diode	ERA15-06
D806	79060009	Diode	RU-1P
D807	79060013	Diode	AG01
D808	79060064	Diode, Zener	MTZJT-77-18B
D809	79060016	Diode	ERA15-06
D810	79060064	Diode, Zener	MTZJT-77-18B
D811	79060064	Diode, Zener	MTZJT-77-18B
D812	79060064	Diode, Zener	MTZJT-77-18B
D821	79060032	Diode	RK49LF-L1
D822	79060010	Diode	RK46
D823	79060008	Diode	RU2YX
D824	79060013	Diode	AG01
D825	79060013	Diode	AG01
D826	79060013	Diode	AG01
D827	79060010	Diode	RK46
D831	79060007	Diode, Zener	UZ3.0BSB
D832	79060034	Diode, Zener	MTZJT-77-10B
D833	79060034	Diode, Zener	MTZJT-77-10B
D834	79060005	Diode, Zener	UZ11BSB
D871	79060009	Diode	RU-1P
D872	79060012	Diode	ERA15-02
D873	79060064	Diode, Zener	MTZJT-77-18B
D881	79060013	Diode	AG01
D882	79060013	Diode	AG01
D883	79060013	Diode	AG01
D884	79060005	Diode, Zener	UZ11BSB
D885	79060029	Diode, Zener	6.8V
		- CAPACITORS -	
⚠C801	79020196	Cap, Film	0.22μF M 275V
⚠C802	79020028	Cap, Ceramic	470pF Z 250V
⚠C803	79020028	Cap, Ceramic	470pF Z 250V
⚠C804	79020196	Cap, Film	0.22μF M 275V
⚠C811	79020197	Cap, Ceramic	1000pF K 250V
		- RESISTORS -	
⚠R802	79030055	Res, Oxide Metal	1MΩ J 1/2W
		- MISCELLANEOUS -	
⚠F801	79087001	Fuse	1.6A, 250V
⚠F821	79070054	Fuse	125V, 3.5A
⚠F822	79070054	Fuse	125V, 3.5A
⚠F823	79070054	Fuse	125V, 3.5A
⚠F824	79070055	Fuse	125V, 2.0A
⚠F825	79070055	Fuse	125V, 2.0A
⚠F826	79070055	Fuse	125V, 2.0A
⚠F827	79070055	Fuse	125V, 2.0A
⚠P802	79089118	AC Inlet	
⚠T801	79010025	Line Filter	183Y0R5
⚠T802	79010030	Transformer	SRW3020ED5-212
⚠T871	79010029	Transformer	SRW2820ED5-207
■EU03	--------	PC Board Assy	Front
		- INTEGRATED CIRCUITS -	
IC101	79040251	IC	TMP87CH75F-1J55
		- TRANSISTORS -	
Q111	79050001	Transistor, Chip	RN2402
Q112	79050001	Transistor, Chip	RN2402
		- DIODES -	
D103	79060022	Diode, Chip	1SS368
D111	79060065	Diode, LED	MVL-354B
D112	79060065	Diode, LED	MVL-354B
		- MISCELLANEOUS -	
BZ101	79089086	Buzzer	HAS-RP2-14-41-11
S105	79089020	Switch	Push
S106	79089020	Switch	Push
S107	79089020	Switch	Push
S108	79089020	Switch	Push
S110	79089020	Switch	Push
S111	79089020	Switch	Push
X101	79089095	Oscillator, Ceramic	8MHz

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
■EU04	--------	PC Board Assy	Power Switch
		- TRANSISTORS -	
Q106	79050001	Transistor, Chip	RN2402
Q107	79050001	Transistor, Chip	RN2402
		- DIODES -	
D106	79060033	Diode, LED	
		- MISCELLANEOUS -	
S113	79089020	Switch	Push
■EU05	--------	PC Board Assy	Output
		- INTEGRATED CIRCUITS -	
ICS01	79040044	IC	NJM4580E
ICS02	79040273	IC	NJM79M05DLA
ICS03	79040272	IC	NJM78M05DLA
ICV01	79040280	IC	ADG774BRQ
ICV02	79040277	IC	AD8073JR
ICV03	79040277	IC	AD8073JR
ICV04	79040280	IC	ADG774BRQ
ICV05	79040281	IC	AD8072JR
ICV06	79040281	IC	AD8072JR
ICW01	79040274	IC	NJM5532M
ICW02	79040274	IC	NJM5532M
ICW03	79040274	IC	NJM5532M
ICW04	79040274	IC	NJM5532M
ICW05	79040274	IC	NJM5532M
ICW06	79040274	IC	NJM5532M
ICW07	79040274	IC	NJM5532M
ICW08	79040274	IC	NJM5532M
ICW09	79040274	IC	NJM5532M
ICW10	79040274	IC	NJM5532M
ICW11	79040274	IC	NJM5532M
ICW12	79040274	IC	NJM5532M
ICW19	79040274	IC	NJM5532M
ICY01	79040130	IC	NJU6321PE-TE1
ICY02	79040130	IC	NJU6321PE-TE1
ICY03	79040087	IC	TC7W241FU
ICY04	79040011	IC	TC7W04F
ICY05	79040270	IC	TC7WT74FU
ICY06	79040102	IC	NJM2370U05
ICY07	79040271	IC	DS9638CM
ICY08	79040275	Terminal, Optical	TOTX176
ICY09	79040087	IC	TC7W241FU
ICY10	79040087	IC	TC7W241FU
ICY11	79040278	IC	TA48M05F
ICY12	79040276	IC	AD1853JRSRL
ICY13	79040276	IC	AD1853JRSRL
ICY14	79040276	IC	AD1853JRSRL
ICY15	79040102	IC	NJM2370U05
ICY16	79040102	IC	NJM2370U05
ICY17	79040102	IC	NJM2370U05
ICY18	79040008	IC	TC7S32F
ICY19	79040258	IC	TC7SH86F
ICY20	79040247	IC	S-814A33AUC-BCX
ICY21	79040007	IC	TC7S08F
		- TRANSISTORS -	
QS01	79050079	Transistor, Chip	2SA1213-Y
QS02	79050083	Transistor, Chip	2SC2873-Y
QS03	79050043	Transistor, Chip	RN1402
QS04	79050001	Transistor, Chip	RN2402
QV01	79050018	Transistor, Chip	2SA1162
QV02	79050018	Transistor, Chip	2SA1162
QV03	79050018	Transistor, Chip	2SA1162
QV04	79050018	Transistor, Chip	2SA1162
QV05	79050015	Transistor, Chip	HN1B01F
QV06	79050018	Transistor, Chip	2SA1162
QV07	79050018	Transistor, Chip	2SA1162
QV08	79050015	Transistor, Chip	HN1B01F
QV09	79050015	Transistor, Chip	HN1B01F
QV10	79050015	Transistor, Chip	HN1B01F
QV11	79050015	Transistor, Chip	HN1B01F
QV14	79050014	Transistor, Chip	HN1C03F
QV15	79050016	Transistor, Chip	2SC2712
QW01	79050014	Transistor, Chip	HN1C03F
QW02	79050014	Transistor, Chip	HN1C03F
QW03	79050014	Transistor, Chip	HN1C03F
QW04	79050014	Transistor, Chip	HN1C03F
QW05	79050014	Transistor, Chip	HN1C03F
QW06	79050014	Transistor, Chip	HN1C03F
QW07	79050043	Transistor, Chip	RN1402
QW08	79050043	Transistor, Chip	RN1402
QW09	79050014	Transistor, Chip	HN1C03F
QW10	79050014	Transistor, Chip	HN1C03F
QW11	79050001	Transistor, Chip	RN2402
QW12	79050001	Transistor, Chip	RN2402
QW13	79050012	Transistor, Chip	RN4601
QW14	79050012	Transistor, Chip	RN4601
QY01	79050043	Transistor, Chip	RN1402
QY02	79050001	Transistor, Chip	RN2402
QY03	79050001	Transistor, Chip	RN2402
QY04	79050001	Transistor, Chip	RN2402
QY05	79050043	Transistor, Chip	RN1402
QY07	79050079	Transistor, Chip	2SA1213-Y
QY08	79050012	Transistor, Chip	RN4601
QY09	79050012	Transistor, Chip	RN4601
QY10	79050012	Transistor, Chip	RN4601
QY11	79050001	Transistor, Chip	RN2402
QY12	79050001	Transistor, Chip	RN2402
QY13	79050001	Transistor, Chip	RN2402
QY14	79050012	Transistor, Chip	RN4601
QY15	79050012	Transistor, Chip	RN4601
QY16	79050012	Transistor, Chip	RN4601
		- DIODES -	
DS01	79060067	Diode	1SS362
DS02	79060067	Diode	1SS362
DV01	79060028	Diode, Chip	1SS226
DV02	79060028	Diode, Chip	1SS226
DV03	79060028	Diode, Chip	1SS226
DV04	79060028	Diode, Chip	1SS226
DV05	79060028	Diode, Chip	1SS226
DV07	79060028	Diode, Chip	1SS226
DW01	79060022	Diode, Chip	1SS368
DW02	79060022	Diode, Chip	1SS368
DW03	79060066	Diode	1SS361
DW04	79060066	Diode	1SS361
DY01	79060026	Diode	UDZS10B
DY03	79060022	Diode, Chip	1SS368
DY04	79060066	Diode	1SS361
DY05	79060066	Diode	1SS361
DY06	79060066	Diode	1SS361
DY07	79060066	Diode	1SS361
DY08	79060066	Diode	1SS361
DY09	79060066	Diode	1SS361
DY10	79060066	Diode	1SS361
		- MISCELLANEOUS -	
JV01	79089096	Plate, Jack	Video-S
JV02	79089114	Plate, Jack	Video
JV03	79089117	Jack, Scart	
JW01	79089098	Plate, Jack	2CH
JW02	79089099	Plate, Jack	5.1CH
JY01	79089100	Plate, Jack	Digital Audio
KY01	79089116	Relay	
KY02	79089116	Relay	
XY01	79089008	Crystal	HC49/U24.576MHz
XY02	79089115	Oscillator	HC49/U22.579M
■EU16	--------	PC Board Assy	Sub Video
		- INTEGRATED CIRCUITS -	
IC001	79040253	IC	GMVLX1A-X
IC002	79040254	IC	GMAFMC
IC004	79040279	IC	GMCP2
IC005	79040256	IC	MSM54V25632A
IC006	79040257	IC	ADV7192KST
		- TRANSISTORS -	
Q001	79050043	Transistor, Chip	RN1402
		- MISCELLANEOUS -	
X001	79089108	Oscillator	24MHz
■EU19	--------	PC Board Assy	Display
		- MISCELLANEOUS -	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		LOCATION NUMBER	PART NUMBER	DESCRIPTION
A101	79089107	Display, FL	20U47100SAN			
MT101	79080140	Module, RMT	GP1U261X			

SPECIFICATIONS

DVD Player/Outputs/Supplied Accessories

[DVD Player]

Power supply	100 - 240 V AC, 50/60 Hz
Power consumption	27 W
Mass	11.0 kg
External dimensions	430 x 118 x 315 mm (W/H/D)
Signal system	PAL/3.58 NTSC
Laser	Semiconductor laser, wavelength 650 nm/780 nm
Frequency range	DVD linear sound : 48 kHz sampling 4 Hz to 22 kHz 96 kHz sampling 4 Hz to 44 kHz 192 kHz sampling 4 Hz to 88 kHz
Signal-to-noise ratio	More than 120 dB
Audio dynamic range	More than 120 dB
Harmonic distortion	Less than 0.0006%
Wow and flutter	Below measurable level (less than ± 0.001% (W. PEAK))
Operating conditions	Temperature: 5 °C to 35 °C, Operation status: Horizontal

[Outputs]

Video output (SCART)	1.0 V (p-p), 75 Ω, SCART socket x 1
Video output (Phono type)	1.0 V (p-p), 75 Ω, negative sync., pin jack x 1
S video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., Mini DIN 4-pin x 1 (C) 0.3 V (p-p), 75 Ω
Component video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., pin jack x 1 (P_B)/(P_R) 0.7 V (p-p), 75 Ω, pin jack x 2
Audio output (SCART)	2.0 V (rms), 330 Ω, SCART socket x 1
Audio output (BITSTREAM/PCM OPTICAL)	Optical connector x 1
Audio output (BITSTREAM/PCM COAXIAL)	0.5 V (p-p), 75 Ω, pin jack x 1
Audio output (2CH AUDIO)	2.0 V (rms), 330 Ω, pin jacks (L, R) x 1
Audio output (5.1CH SURROUND)	2.0 V (rms), 600 Ω, pin jacks x 6

[Supplied Accessories]

Audio/video cable	1
Remote control (SE-R0039)	1
Batteries (R03)	2
Power cord	1

* Designs and specifications are subject to change without notice.